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ABSTRACT

This study examined the effects of secondary vocational education on the post-high school educational activities of youth. Data used in the study were taken from the National Longitudinal Surveys of Labor Market Experience, New Youth Cohort (NLS Youth), supplemented with information from the respondents' high school transcripts. Findings included the following: (1) a majority of high school graduates, both vocational and nonvocational, enroll in some type of postsecondary program; (2) higher levels of educational aspirations were associated with higher probabilities of postsecondary participation; (3) less frequent participation in postsecondary programs was found for minority youth with at least some vocational experience, although, for whites, secondary vocational education did not seem to reduce overall postsecondary participation; (4) class rank, and, for whites only, parents' education influenced secondary participation; (5) living in the West was associated with a higher attendance in two-year colleges; and (6) for certain subgroups, a higher unemployment rate and residence in a rural area showed an increased likelihood of postsecondary participation. Issues raised for policy considerations are these questions: Should secondary vocational training programs take the responsibility for fully equipping graduates with the necessary skills to enter the labor market immediately? Or, should vocational education simply provide the needed prerequisites for further training after high school? The study concluded that policymakers should be aware of the diversity of secondary vocational education when deciding these questions. (KC)

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POSTSECONDARY EXPERIENCES OF STUDENTS WITH VARYING PARTICIPATION IN SECONDARY VOCATIONAL EDUCATION

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U.S. DEPARTMENT OF EDUCATION
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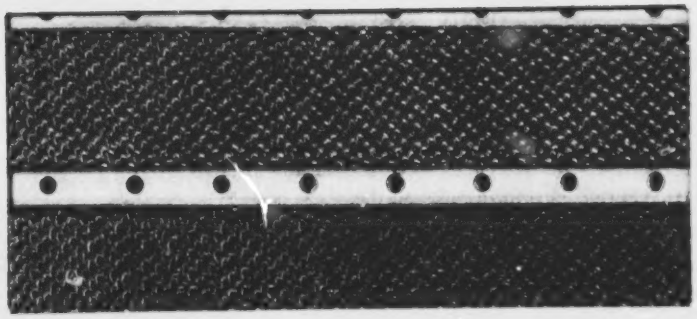

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FOREWORD

The postsecondary educational experiences of secondary vocational education graduates are examined in this study. It builds upon the five patterns of participation that were identified in the first study in this series of three. These patterns reflect the variability of the secondary vocational education experience. Postsecondary education experience is examined in terms of the variability reflected in the patterns.

The major focus of the report is on the relationships between the patterns of participation and the amount and kind of postsecondary education. To allow this relationship to emerge, relevant individual and contextual variables are controlled.

The combined data from the National Longitudinal Survey (NLS) of Labor Market Experience, New Youth Cohort (NLS Youth), and the high school transcripts of a subsample of the NLS panel were used for analysis. The availability of transcript data permitted the use of more precise and descriptive curriculum classification measures for the high school graduates for whom the comparisons were made.

The National Center is appreciative of the U.S. Department of Labor's research effort, the New Youth Cohort of the National Longitudinal Surveys, being carried out by Michael Borus, Director of the Center for Human Resource Research, The Ohio State University. He was most cooperative in entering into the agreement under which the transcript data were merged with the interview data of the New Youth Cohort and from which this report was prepared. We wish to express our appreciation to him and to two of his staff members, Susan Carpenter and Michael Motto, who assisted in conducting the analyses for this report.

Additionally, the National Center extends its appreciation to the U.S. Department of Education, Office of Vocational and Adult Education, which funded the National Center's effort to collect the transcript data and to conduct extensive analysis of the effects of participation in vocational education.

This project was conducted in the Evaluation and Policy Division of the National Center under the direction of N. L. McCaslin, Associate Director. We wish to thank the project staff, Paul B. Campbell, Fidelia Chukwuma, Sterling Cox, John Gardner, Morgan V. Lewis, and Patricia Seitz, for their work in preparing this report. Annegret Harnischfeger of Northwestern

University, Edmond Marks of Penn State University, and Larry Hotchkiss of the National Center enhanced the quality of the report through their thoughtful critiques and suggestions. Bernice DeHart and Kathie Medley prepared the document with meticulous care.

Robert Taylor
Executive Director
National Center for Research
In Vocational Education

EXECUTIVE SUMMARY

The principal objective of this report was to examine the effects of secondary vocational education on the post-high school educational activities of youth. The following are the major highlights of the analyses.

- A majority of high school graduates, both vocational and nonvocational, enroll in some type of postsecondary program.

- Higher levels of educational aspirations were associated with higher probabilities of postsecondary participation. This was true for attendance in four-year colleges and in all postsecondary programs combined. In fact, educational aspirations explained a larger proportion of postsecondary behavior than any other variable.

- Less frequent participation in postsecondary programs was found for minority youth with at least some vocational experience. There was, however, no pattern of significance that suggested that more intensive vocational preparation was systematically associated with reduced levels of postsecondary attendance. For whites, secondary vocational education does not seem to reduce overall postsecondary participation, although it does influence the type of postsecondary program pursued.

- Additional factors which positively influence postsecondary participation include class rank and, for whites only, parents' education. Living in the West was associated with a higher attendance in two-year colleges, and, for certain subgroups of the youth population, a higher unemployment rate and residence in a rural area showed an increased likelihood of postsecondary participation.

The data used in the study were taken from the National Longitudinal Surveys of Labor Market Experience, New Youth Cohort (NLS Youth). These interview data were supplemented with information from the respondents' high school transcripts. The transcripts were collected by the National Center for Research in Vocational Education. The transcript data were used to derive the respondents' patterns of vocational participation and to better identify students' actual involvement in vocational programs. The subsample of the NLS Youth used in the analyses consisted of high school graduates for whom transcript information was available for grades nine through twelve.

The policy implications derived from this research differ

depending upon the priorities established by policymakers for the role of vocational education. Should secondary vocational training programs take the responsibility for fully equipping graduates with the necessary skills to immediately enter the labor market? Or, should vocational education simply provide the needed prerequisites for further training after high school? At the present time vocational education probably assumes both of these roles, as well as many others, for some students. Policymakers concerned with the present impact and future direction of vocational education must be aware of this diversity if effective policy is to be developed.

If, for example, immediate employment is the desired outcome, youth should receive sufficient training at the secondary level to accomplish this goal. If meeting this end is not possible in the high school, however, students should be encouraged to pursue postsecondary education and be provided the necessary skills to do so. On the other hand, if higher education for most vocational students is considered to be a more appropriate outcome, policy should be directed toward improving articulation between secondary and postsecondary schooling. The pervasive effect of educational aspirations on postsecondary attendance in this and other studies suggests one arena in which policy might be effective in producing positive change.

With regard to special populations, policymakers should recognize that high school curriculum appears to have a stronger effect for minorities, particularly males, on postsecondary participation. This finding suggests that careful consideration should be given to how any change in vocational education policy can or will affect these students.

The findings of this study suggest a number of areas to which policy should attend. The key criteria, however, should be recognition of the diversity of secondary vocational education. The policymaker should be fully aware of this factor when considering the design, maintenance, and evaluation of vocational education.

CHAPTER ONE

THE NATURE AND PURPOSE OF THE STUDY

The Issues

Although secondary vocational education would seem, by its very designation, to have as an objective employment rather than further postsecondary education, substantial numbers of vocational graduates do participate in postsecondary education and training (Mertens et al. 1980). One can speculate about a variety of reasons for this fact, including the desire for further training, employment dissatisfaction, changing aspirations, peer or family pressure, and similar forces. For whatever reason, it is generally accepted that postsecondary education is desirable for the majority of students who are able to take advantage of it.

The association of higher wages and higher job prestige with postsecondary education, together with the prestige accorded to college degrees independent of their labor market effects, supports this acceptance. There are also some individuals who argue that postsecondary education is not an economically productive investment of time for all students, particularly those students who do not aspire to college degrees, those students whose lives are not primarily driven by labor market considerations, and those students for whom the college experience is likely to be unsuccessful.

The policy concerns relating to the issues posed by the interrelation between secondary vocational education and education or training after high school deal with options for changing the nature of that interrelationship. Whatever option is adopted for policy focus should take into account some basic information about the present state of vocational graduates' participation in postsecondary education or training. To provide this information, three questions are raised for consideration. This study will provide some answers to them from the National Longitudinal Survey of Youth Labor Market Experiences (NLS Youth). The questions are as follows:

- What proportion of vocationally trained high school graduates continue with postsecondary education and under what combinations of conditions?

- What kinds of postsecondary education do secondary vocational education graduates pursue and what conditions are related to each kind?

- What is the nature of the conditions that control or influence the amount and kind of postsecondary education engaged in by secondary vocational education graduates? In particular, if modification of the rate and kind of postsecondary educational participation is desirable, how amenable to manipulation by policy are these conditions?

These issues are not new and have been examined by other researchers with other sets of data. An analysis of some pertinent studies relating to each issue is provided in the next section.

What Is Known

Studies Relating to Rate of Participation

Most studies of the transition rates between secondary and postsecondary education appear to be focused on the academic curriculum. Alexander, Cook, and McDill (1978) for example, report that plans to attend college are enhanced most by academic track placement in high school. Enrollment in such a track increases by 30 percent the probability that seniors will be planning or have already made plans to continue their education in comparison with equally motivated, encouraged and academically able youth in nonacademic programs. This effect of curriculum is paralleled in the actual likelihood of applying to colleges for admission. Academic track students have a 22 percent greater likelihood of applying than their counterparts in nonacademic curricula.

Evidence pertaining to the degree to which these plans are actually carried out is provided in the comprehensive study by Grasso and Shea (1979). They analyzed portions of the National Longitudinal Surveys (NLS) of Labor Market Experience, Boys and Girls Cohorts. Among boys who were in twelfth grade in 1966 and had graduated as of the interview in 1967, 56 percent of the whites and 32 percent of the blacks were enrolled in college. Among white students enrolled in college, 16 percent were vocational graduates, 27 percent were general graduates, and 87 percent were academic graduates. The percentages for black graduates were 22, 14, and 71, respectively. A regression equation predicting the likelihood that the respondent had at least one year of college produced a negative 10 percent effect for vocational education for both races.

Grasso and Shea did not analyze in detail the effects of variation within the differing curricula on postsecondary

education and training, but did separate out from the vocational curriculum commercial courses for men and business and office courses for women. This breakdown produced only the previously reported 10 percent negative effect for men. For women, the office and business curriculum produced a 12 percent negative effect for whites and a 14 percent negative effect for blacks. No other significant curriculum effects were found.

Gelb (1979), on the other hand, argues that the area of vocational specialty makes a difference in postsecondary attendance, beyond the differences generally reported for college/noncollege curricula. Using Class of 1972 data, subsequent to the 1975 interviews, he reported that roughly 34 percent of the vocational students participate in postsecondary education, compared to 46 percent for general students and 83 percent for academic students. However, within the vocational program areas, the attendant percentages ranged from 30 percent for distributive education to 56 percent for health. Gelb also reported the results of several regression equations in which variables such as race, sex, aptitude, a composite socioeconomic status (SES), and class rank were included. Rather than using a dummy variable, he placed values on the types of postsecondary education. He interpreted these results to show that the curriculum tracks of health and general education have the least negative effect on postsecondary education participation, followed by home economics and agriculture, with the most negative effects attributed to business, trade and industrial, and distributive education. Because there are significant policy implications in this ordering of effects, replication of the analysis is needed.

Rather than defining the high school curriculum in discrete categories, Meyer (1981) used the percentage of a student's courses that are vocational as the curriculum measure in a linear probability model of postsecondary choice. Like Gelb's, his data were from the Class of '72 study, and he defined four types of postsecondary experience: no education, vocational school, junior college, and regular (four-year) college. Unlike Gelb's, his dependent variables were four mutually exclusive dichotomous variables, and he estimates separate equations for each.

Although his curriculum variable is measured continuously, Meyer experimented both with the single variable and with a three-dichotomous-explanatory variable form (to allow for non-linearity). The three intervals he defined were 0-20 percent, 20-35 percent, and more than 35 percent of all courses in vocational programs. He found that in these intervals 69 percent, 51 percent, and 32 percent, respectively, of women, and 73 percent, 54 percent, and 35 percent of men participated in postsecondary education at least some time within the first seven years after graduating from high school. He presents no comparable figures

by vocational specialty areas, though in his linear probability models he distinguishes between what he calls "occupational" and "home economics" courses. He finds that both the percentage of all courses that are in occupational vocational education and the percentage in home economics are significantly associated with a lower probability of any postsecondary participation.

Although the analytic methods used by these four studies are not directly comparable--having differently defined dependent variables, and using samples drawn across the span of a generation or more--the magnitude of the differences in proportion suggest that either the relative effects of vocational and general curricula are still elusive or changes have occurred over time. Thus, further examination with the most recently available data, NLS Youth, appears warranted.

Studies Relating to Kinds of Postsecondary Education

The second question of interest in this study concerns the kinds of postsecondary education that are undertaken by vocational graduates. The literature on this issue appears to be quite sparse. Mertens et al. (1980) summarize a group of studies that they classify as less rigorous. In general, these studies report that the most frequently reported proportion of former vocational students going beyond two years is less than 10 percent. Mertens also reports the results of four studies classified as more rigorous. These studies show between 16 and 54 percent of vocational students engaging in two or more years of postsecondary education. Not only do these figures vary greatly, but they tell us virtually nothing about the kind of postsecondary education received or the changes over time.

Another study, conducted by the Oregon Department of Education (1978), is a follow-up of the high school graduates of 1976 in the state of Oregon. This study reports that 38 percent of the vocational graduates attended community colleges and 6 percent attended private vocational colleges. In contrast, general and academic students were represented in community colleges at a 24 percent proportion, with less than 2 percent attending private vocational schools.

The previously cited study by Grasso and Shea (1979) provides a bit more information. They report that men from occupational curricula are somewhat more likely to report company training, apprenticeship, or other vocational training than academic or general graduates. Women, on the other hand, are more likely to receive "professional or technical" training if they are academic curriculum graduates, and "secretarial" training if they are business and office graduates. Both academic and business and office graduates are likely to receive

additional clerical training. No additional comparisons were reported for other vocational graduates.

The studies by Gelb (1979) and Meyer (1981) contain similar information. Gelb reported attendance for vocational students in vocational, two-year, and four-year postsecondary institutions at 14, 12, and 8 percent, respectively. General students attend the same types of institutions in proportions of 12, 15, and 19 percent; academic students are reported at percentages of 6, 13, and 63, respectively. Among women students with up to 20 percent of course work in vocational areas, 45 percent attend four year colleges, 15 percent attend junior colleges, and 9 percent attend vocational schools. For students with between 20 percent and 35 percent of course work in vocational areas, the percentage attending junior colleges or vocational schools is higher, 16 percent and 13 percent, respectively. When students with more than 35 percent of course work in vocational areas are considered, four-year college attendance continues to drop, to 9 percent, but attendance at junior colleges and vocational schools also drops, to 12 percent and 11 percent, respectively. Men show similar patterns for four-year and junior colleges as the percentage of vocational course work increases. The percentage of students attending four-year colleges steadily falls from 51 percent to 27 percent to 11 percent. Attendance at junior colleges rises from 17 percent to 19 percent and then falls to 14 percent. Unlike women's, men's participation in postsecondary vocational programs increases steadily with the percentage of vocational course work, from 6 percent to 8 percent to 10 percent.

Meyer's evaluation of the significance of the effec of vocational education on postsecondary participation varies across the postsecondary categories and with the extent to which individual circumstances other than curriculum are controlled. For women, a larger fraction of course work in vocational education is significantly associated with a lower likelihood of attending four-year colleges. For white women, but not blacks or Hispanics, more vocational education was associated with a significantly lower likelihood of attending junior college. Only for white women and only when individual circumstances were not controlled was more vocational education associated with a higher likelihood of attending a vocational school. When many individual circumstances are controlled for, Meyer finds that white women with more vocational education are less likely to attend postsecondary vocational school.

Meyer finds that the patterns for men are quite similar, with two exceptions. The negative impact of vocational enrollment on junior college attendance holds for Hispanics as well as whites. And when individual circumstances are controlled to the maximum extent, additional high school vocational education has

no significant impact on the likelihood of attending postsecondary vocational schools.

A conclusive pattern thus does not emerge from the available literature, but there appears to be a consistent tendency for vocational educational students to take postsecondary education of the technical and relatively short term type. Further, the relationship of various demographic variables to type of postsecondary training does not appear to be adequately studied for vocational graduates.

Studies Relating to the Nature of Noncurricular Variables

The final issue of concern in this study is the nature of the noncurricular correlates. Variables such as age, sex, race, ability, SES, proximity to postsecondary opportunity, and aspirations for postsecondary education are included in many of the studies reviewed. Examples of this research have been reviewed in the discussion of the first two issues. Additional major attention to the role of these correlates may be found in such works as those by Jencks et al. (1972) and Alexander, Cook, and McDill (1978). The major thrust of these works involves the effects of background characteristics on curriculum choice, which in turn has a demonstrated effect on postsecondary training. The relative magnitude of the direct effect of each variable, as compared to its effect through the others, must necessarily be explicated in order to understand the possible impact of policy. For example, if the impact of SES upon type of postsecondary experience is exercised primarily through the choice of curriculum, and after the choice is made SES has little additional effect, then policy designed to change the postsecondary experience of students from an SES level of interest must address the point of choice. If, on the other hand, SES has a substantial direct effect on postsecondary experience in addition to an effect on curriculum choice, then policy to change postsecondary experience must address both points. The degree to which the influences can be changed is also an important issue for policy decisions. The effect of background variables on differing kinds of postsecondary education is a further matter of concern, which is not adequately addressed in much of the literature.

One analysis of interest that specifically addresses the direct and indirect effect of background variables on the number of years of postsecondary training is found in Grasso and Shea (1979). These authors compared three path analytic models drawn from Jencks et al. (1972): one ignoring educational aspirations, another assuming them to be antecedent to curriculum choice or assignment, and a third assuming them to be a function of curriculum. Other noncurricular variables included in these models were place of residence, scholastic ability, and socioeconomic

origins. The models were run separately for four race/sex classifications. Educational aspirations add significantly to the explanatory power of the models, more so when they are seen to be in part affected by curriculum choice or assignment.

Meyer (1981) similarly accounts for the effect of aspirations on postsecondary participation. But his model treats aspirations as an unobserved variable. The background attributes that he finds affecting postsecondary participation, either directly or indirectly (through aspirations), include academic ability, parents' education, parents' educational aspirations for their children, peer aspirations, race, high school work experience, parents' income, residence, and local labor market conditions.

The nature of the explanatory variables that appear to alter the kind and extent of postsecondary participation by vocational education graduates seems, at the very least, to require verification through a replicating study, and to need further clarification if public policy is to reflect appropriate understanding of these variables.

The Specific Research Questions

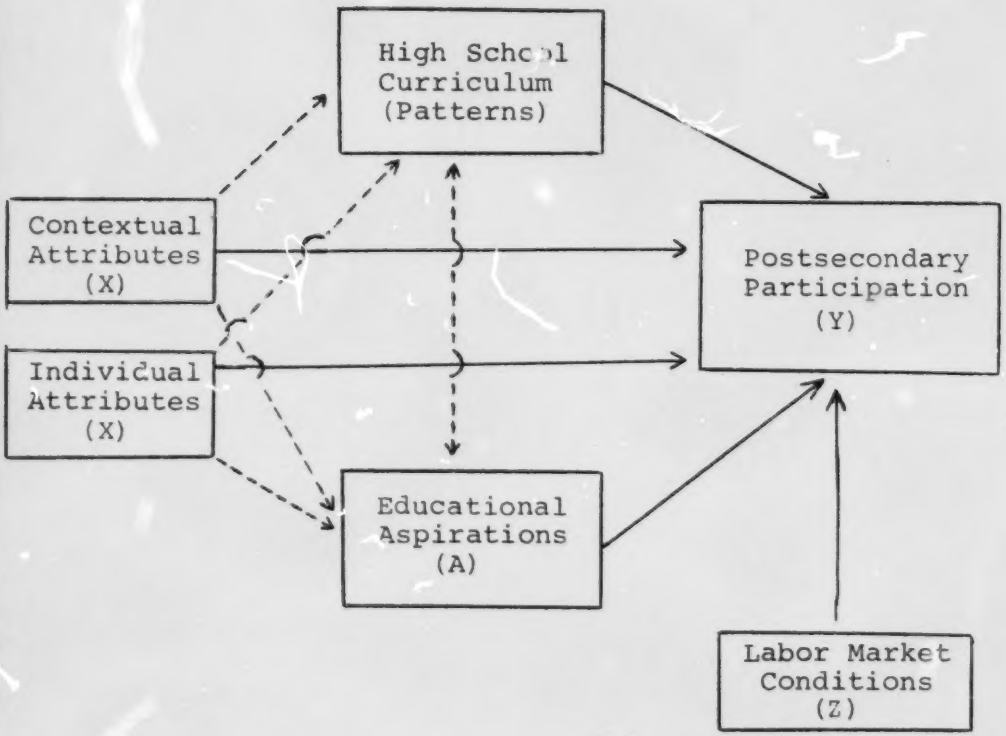
The three questions were addressed by operationally defining several types of postsecondary education as dichotomous dependent variables for several variations of the sample. This study was intended to examine them in some detail with data from a recent sample, the NLS Youth.

The variety of descriptions of postsecondary education were treated as dependent variables, in order to allow a comparative look at the conditions that seem to influence membership in one or another category. The general model of the expected relationships is shown in figure 1. The dependent variables, represented by box (Y), included a general class called "successful postsecondary experience", a two-year college category, and a four-year college category.

The explanatory variables were divided into five classes. The high school curriculum was represented by the patterns of participation developed in an earlier study (Campbell, Orth, and Seitz 1981) and by a category of no vocational credits. Secondary curriculum was considered to have direct effect upon postsecondary experience and to be affected by contextual attributes (X), individual attributes (X), and educational aspirations (A). Labor market conditions (Z) were also considered to have direct effects that were relatively independent of the other variables. Contextual attributes and individual attributes were both considered to have direct effects and to influence both curriculum and aspirations. Contextual attributes include variables such as

FIGURE 1

MODEL OF POSTSECONDARY EXPERIENCE
FOR HIGH SCHOOL
VOCATIONAL GRADUATES



Key —— Direct Channels of Effects

--- Indirect Channels of Effects

residence (i.e., rural) and region. Individual attributes include class rank* and family factors. The category of educational aspirations reflected not only what each respondent wished to achieve, but also what was expected.

These variables are by no means considered exhaustive of the possible explanatory variables relating to postsecondary education. They are limited in both completeness and rigor of measurement by the structure of, and availability in, the data. The rationale for the selection and derivation of each variable is described in more detail in the next chapter, where the equations that evaluate the adequacy of the model and show the effects of the variables are also presented.

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* Class rank is used here as a proxy for academic aptitude, since for the 1980 interview the NLS Youth did not have a direct measure of academic aptitude. Class rank is actually a measure of academic achievement, and as such it could be modeled as a function of contextual and individual attributes that is determined simultaneously with curriculum and aspirations. That approach would be appropriate if the objective of this report were to model the complete educational experience of students. This report has a far more modest objective, however. It takes the high school experience as given and attempts to estimate the impact of factors that influence the likelihood of a successful postsecondary educational program. The desire to keep the analysis as simple as was consistent with the project's objectives and the absence of a direct measure of academic aptitute argued for treating class rank as an incidental outcome of the high school experience, strongly indicative of academic aptitude but not a determinant of curriculum or aspirations.

CHAPTER TWO

THE DATA AND THE PROCEDURES

The data used for analysis in this study were taken from the combined National Longitudinal Survey of Youth Labor Market Experience (NLS Youth) and the high school transcripts of a subsample of the NLS panel. The Center for Human Resource Research (CHRR), with support from the U.S. Departments of Labor and Defense, initiated the NLS Youth data collection in 1979. At the time of the first interview, the participants in the survey were asked to sign a release permitting the disclosure of their high school transcripts. In 1980, with funding from the U.S. Department of Education, Office of Vocational and Adult Education, and under a collaborative agreement with CHRR, the National Center for Research in Vocational Education obtained the high school records of the NLS Youth respondents who were seventeen years of age or older at the time of the first interview.* The merger of the two data sources provides a cost-effective and unique information base to examine the course-taking behavior of secondary students and to evaluate better the post-high school educational activities of youth.

NLS Youth Cohort

The NLS Youth is a national probability sample of 12,686 respondents who were between the ages of fourteen and twenty-one when originally selected in the fall of 1978. The sample was drawn from the youth population in three stages: a cross-sectional sample; a supplemental sample of blacks, Hispanics and economically disadvantaged whites; and a sample of youth serving in the military. Approximately 2 percent of the NLS Youth respondents are Native Americans or of Asian or Pacific Island descent. Extensive background information about family,

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* The transcripts of respondents who were fifteen and sixteen at the first interview are being collected in the current contract year.

schooling, work history, and training was gathered for all the respondents in the NLS Youth survey when they were first interviewed early in 1979. In addition, data on current educational and labor market activities were obtained. The first follow-up interviews were conducted in 1980. The rate of attrition in the second round of the survey was 4.3 percent, yielding a sample size of 12,141.* Follow-up interviews are scheduled with the participants in the NLS Youth through 1984.

NLS Youth Transcript Collection Effort

The transcript collection effort was initiated through a subcontract let by the National Center for Research in Vocational Education to the National Opinion Research Center (NORC) to secure and code the transcripts of the NLS Youth respondents. The target sample for the data collection, which was conducted in 1980, was youth seventeen years and older at the time of the 1979 NLS interview (N=8,420), 94 percent of whom had given permission to collect their transcripts. Persons excluded from the transcript collection were those less than seventeen years of age who presumably had not completed secondary school; persons in the military sample; and youth in foreign high schools. With several follow-up efforts, a 77 percent response rate was achieved.

Information from the individual transcripts included the number of days absent in grades nine through twelve, academic rank in class, and scores for various aptitude tests. Course information included the specific course taken, the grade (or year) in which the course was taken, the letter grade received, and the credit received for the course. Each course credit was converted to a common scale, the Carnegie credit unit, at the time of coding. This system assigns 1.0 credit to a standard full-year course, or one course taken one hour a day for 180 days. The Carnegie credit unit system provides a method that is sensitive to the length of time spent in the classroom, rather than a simple count of courses taken, thus facilitating a comparison of the youth's vocational education experiences. A coding system to identify the actual courses taken by the student was developed from the Standard Terminology for Curriculum and Instruction in Local and State School Systems Handbook VI (Putnam and Chismore 1970).

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* For a full description of the sample and weighting procedures used in the survey and a descriptive analysis of the first year's data, see Borus et al., Youth Knowledge Development Report 2.7 Findings of the National Longitudinal Survey of Young Americans, 1979 (1980).

Data Used for this Study

The subsample selected for analysis consisted of civilian respondents who had reported completing high school and for whom course information was available for grades nine through twelve. Cases were eliminated from the original sample size of 12,686 by the following criteria: (1) not interviewed in 1980 (n=-545); (2) serving in the military in 1980 (n=-994); (3) less than 12 years of schooling completed (n=-6059); and (4) incomplete information on the student's transcript (n=-2052). This screening process yielded a sample of 3,056 respondents to be used in the analysis. While it was recognized that some types of postsecondary education and training do not require high school certification, this strategy provides a common denominator with which to examine the impact of secondary vocational education on postsecondary schooling. Because the measure of vocational experience was derived from the transcript data, it was necessary to screen the high school records and eliminate cases that did not have adequate course information for each grade. The restrictions placed on the selection of the cases facilitated more precise estimates of vocational education participation and subsequent post-high school educational activities.

Table 2.1 presents the race and sex distribution of the sample used for analysis by the year of high school graduation.

TABLE 2.1

YEAR OF GRADUATION OF NLS YOUTH RESPONDENTS
BY RACE AND SEX

Year of Graduation	Race/Sex				
	Minority Males	White Males	Minority Females	White Females	Total
1974-1976	103	326	156	410	995
1977-1978	183	397	227	482	1289
1979-1980	123	199	150	250	722
Total	409	922	533	1142	3006

NOTE: The actual number of (unweighted) respondents in each race/sex group are shown in the table. Cases with some missing data are excluded.

The data clearly show that the sample is diverse in terms of the number of years respondents have been out of school. Approximately 33 percent of the respondents completed school between 1974 and 1976. In comparison, slightly less than one-fourth of the gradutes had been out of school a year or less as of the 1980 interview. The sample (weighted) consisted of approximately 48 percent males and 52 percent females. Eighty-seven percent of the sample were white; 9 percent of the respondents were black; and approximately 4 percent were Hispanic. Other minority members were included in the same category as whites.

A comparison of the NLS Youth sex and race data and independent population estimates of high school graduates within the specified age range (U.S. Department of Labor 1981) showed that the NLS subsample contains a slightly higher proportion of males and whites (approximately two percentage points). Assuming, however, that the additional cases will be proportionally distributed among all categories, these discrepancies will not substantially affect the findings. Examination of the NLS Youth subsample by sociodemographic variables such as geographic region, rural and urban residence, and family socioeconomic status revealed that the data, in general, provide a representative information base that can be used to investigate the effects of secondary vocational education on a national level. (Campbell, Orth, and Seitz 1981).

Variables Used in the Study

The first two specific research questions addressed in this report concern the extent of postsecondary participation by vocational graduates and the kind of educational options exercised. Although these questions appear to be direct and straightforward, several factors impede a simplistic approach. First, the age range of the sample (seventeen to twenty-three) is broad enough that all respondents cannot be expected to be at similar stages in their educational careers. Many of the respondents are recent high school graduates and are just starting postsecondary work. Others have had a longer opportunity to engage in further education and thus may have completed their formal schooling. Therefore, an indicator of postsecondary participation that fails to account for the differing opportunities for these diverse subgroups may produce misleading results. A second factor concerns the types of postsecondary education and training that might be excluded if conventional measures, such as "highest grade completed" or current enrollment status, were used. Youth participating in education and training programs that are outside traditional academia would not be included in such postsecondary indicators. In an effort to compensate for some of these factors, several variables were created and were used in the analysis. A brief description of these variables, both dependent and explanatory, is presented in the next section. Specific

details concerning the use of the variables are discussed in the following section.

Postsecondary Participation

The major dependent variable was labeled "successful postsecondary education." Criteria for a positive value for this dummy variable included (1) receipt of an associate's, bachelor's, or master's degree, (2) receipt of a certificate that was judged to be a legitimate postsecondary endeavor, (3) completion of a noncollege training program, or (4) current enrollment in college or in a postsecondary training program. Construction of the variable in this manner did not impose a limitation on the timing of the postsecondary work; i.e., persons who entered college immediately after high school are treated on an equal basis with those who postponed their education for a period of time. Respondents who were currently enrolled but would not complete their current program were classified differently, however, from those who had previously participated in postsecondary education but had dropped out without completing the program. This difference in classification was necessary, given the age of most respondents, because the ultimate outcome for current enrollees was not yet known.

Similar decision rules were applied to the data to examine the kind of education and training pursued. Dichotomous variables were created for completion or enrollment in two-year college programs and four-year college programs. In addition, an ordinal variable was created which combined the various types of postsecondary education. The variable categories reflected different levels of involvement in postsecondary work: (0) no postsecondary; (1) training program; (2) two-year college; and (3) four-year college. Respondents were assigned on the basis of having ever been enrolled in any of the categories. Cases were placed in the highest applicable category. The categories and the explanatory variables used in the equation were constructed so that a replication of Gelb's work (1979) was possible.

High School Curriculum

Because the primary concern of this research effort was to examine the postsecondary effects of secondary vocational education, the method by which former vocational students were identified was crucial. The classification method used in this study extends beyond the traditional self-report of high school curriculum and reflects the variability of vocational participation. This type of classification procedure is especially important because previous analysis of this and other longitudinal data has shown disagreement between self-report and actual curriculum as high as 40 percent. Using the NLS

transcript data, five patterns of vocational participation were developed and were used as indices of involvement in vocational programs (for supporting data see Campbell, Orth, and Seitz 1981).

The patterns specification of participation in vocational education is an alternative to the three-category classification of curriculum as vocational, general, or academic that is usually used when curriculum is identified by self report. It is an alternative to Meyer's (1981) measure of vocational participation, the proportion of all high school courses a respondent takes that are vocational. Finally, it is an alternative to a simple count of vocational courses taken.

The patterns of participation were developed by (1) operationalizing five descriptive concepts that reflected different aspects of vocational participation; (2) utilizing the five descriptive concepts to formulate a target profile for each of the proposed pattern types; (3) matching the actual profile scores obtained from the student's transcript to the target profiles; and (4) assigning the individual cases to the appropriate pattern type.

Briefly, the descriptive concepts include: (1) the number of credits received in vocational courses in the program area of specialization; (2) the number of program areas in which the specialty was pursued; (3) the number of vocational credits in the program area that were determined to be supportive of the specialty area; (4) a scaled measure of whether the specialty was pursued in the eleventh and/or twelfth grade; and (5) the number of years in which the specialty was taken. A student's area of specialization was defined as the program area (for example, distributive education, home economics) in which at least six-tenths of the total number of vocational credits were received.

These descriptive concepts were used to construct target profiles. The target profiles represented the hypothesized most likely set of scores associated with each pattern type. The transcript record was used to obtain a profile of scores for the descriptive concepts for each student. The actual case profiles were then compared to the target profiles, and assignment to a pattern was based on the Euclidean distance function. A case was assigned to the pattern type from which it had the least distance. The five patterns were labeled Concentrator, Limited Concentrator, Concentrator/Explorer, Explorer, and Incidental/Personal and were ordered by the degree of involvement in vocational education.

For example, Concentrators take an average of six vocational credits over a three-year period. Limited Concentrators generally take about half the number of vocational credits as Concentrators, usually within a two-year span. The next pattern group,

Concentrator/Explorer, is similar to the Limited Concentrator pattern, except that the vocational course work is usually completed early in the high school years. Students classified in the Explorer pattern pursue courses in three or more program areas tut do not achieve any level of specialization. In comparison, Incidental/ Personal students average less than a full credit and generally complete the work in a semester.* These patterns were used in the analyses in place of the traditional curriculum descriptors of vocational, general, and colleqe preparatory.

Contextual or Background Variables

The four major qeographic regions, as defined by the census, are used in this report in order to provide a proxy for the educational options available in various areas of the country. The regions identified were the Northeast, North Central, South, and West.

Because young people from diverse backgrounds may have different educational expectations and schooling patterns, a variable indicating urban or rural residence was also included. From data in the City and County Data Book (U.S. Department of Commerce 1972), the percentage of urban population in the county of residence was employed as a measure of an urban or rural environment. If the county was less than 50 percent urban, the respondent was considered to reside in a rural area.

Individual Attributes

Several variables were used in the analysis that reflected different aspects of the respondent's home environment. Among these were indices of mother's education, father's education, number of siblinqs, oldest sibling's education, father's occupation when respondent was age fourteen, and whether the mother worked outside the home when respondent was age fourteen.

The discussion in chapter 1 suqqests that the home environment affects postsecondary educational participation in three respects. First, the education of parents and older siblings will affect the respondent's aspirations. Second, the educational and occupational status of the parents may have other impacts on postsecondary participation that are independent of

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* For a full description of the methodology and techniques used to construct and validate the patterns of participation variable, the reader is referred to Campbell, Orth, and Seitz 1981.

the effects on aspirations. Initial specifications for the forms of variables to represent these effects tried both linear and nonlinear forms of parents' education variables. The linear forms involved separate continuous measures of the number of years of education for father and mother. The nonlinear form used separate sets of dichotomous variables that indicated completion of fewer than twelve, exactly twelve, between twelve and fourteen, between fourteen and sixteen, and seventeen or more years of education. The sets of dichotomous variables were selected for the final analyses because they better explained successful postsecondary participation.

To allow for the effects of parents' occupational status, dichotomous variables were introduced that identified six broadly defined occupational categories for respondent's father (or mother if the father did not live in the household). These variables did not contribute substantially unless parents' education was excluded from the estimating equation. Moreover, they were highly correlated with the parents' education variables, they weakened estimates of the effects of parents education, and they were not nearly as useful as parents' education in explaining postsecondary participation. Thus, the occupational indicators were dropped from the final analyses in favor of the parents' education variables.

Third, to a significant degree the home environment determines the resources that are available to a family to pay for higher education. The ability to pay is a function of parents' assets and income, other financial commitments the family has, the availability of student loans, and the availability of scholarship support. The NLS Youth survey did not have information for all respondents on the parents' income, assets, or debts. Father's occupation could serve as a very rough proxy for income, but, as was pointed out previously, that variable was dropped from the analysis because it failed to contribute. The availability of student loans is impossible to determine in retrospect. Information was collected about the amount of loans and scholarships actually obtained by students. But such information clearly cannot be used to explain postsecondary participation since it is available only for those respondents who did participate. The only information provided by the survey that casts light on the family's ability to pay for higher education is the number of respondent's siblings.

The socioeconomic status (SES) variable was derived, using four intercorrelated indices of family background. The variables used to construct SES include (1) measure of the family learning environment at age fourteen (i.e., whether newspapers and magazines were received regularly and if persons in the household had a library card), (2) mother's educational attainment, (3) father's educational attainment, and (4) father's (or mother's if the father was absent) occupational prestige score when the

respondent was fourteen years of age. Principal components analysis was used to obtain the appropriate weights for each of the variables and the weights were used with the standardized scores to secure a composite SES score for each respondent.

Initial experiments revealed that when the separate measures of parents' education were included in the equations, the SES variable made little additional contribution to explaining post-secondary participation Its high correlation with parents' education even caused the estimated effects of parents' education to switch sign when SES was included in the equation. Because interpretation of results seemed to be much more straightforward without the SES variable, it was dropped from the final analyses of successful postsecondary participation. It was retained in the replication of Gelb's work in order to conform more closely to Gelb's specification.

The other individual attribute variable used in the study was ability. This variable was measured by using the respondent's academic rank in class as a proxy. It was scaled to range from 0 to 100 to provide comparability across varying school size.

Aspirations

At the time of the first interview, respondents were asked a series of questions concerning their educational aspirations and expectations. Other researchers (e.g., Sewell and Hauser 1975) have determined that educational plans impart important influences on both secondary curriculum choice and postsecondary decisions. Ideally, respondents would be questioned about their future plans at an early point in their educational careers. However, because persons in the NLS Youth span a broad age range, the measures of aspirations and expectations are not as "clean" as one would desire. The relevant variables used in this analysis include the highest grade the respondent would like to complete, the highest grade expected to be completed, the highest grade completed by respondent's oldest sibling, and the highest grade desired by the best friend of the respondent. In addition, respondents were asked if they desired additional occupational or job training besides high school and college.

Initial experiments with these measures of aspirations showed that the highest grade the respondent expected to complete was most closely related to successful postsecondary participation, as defined previously. Thus, the expectation form for the aspirations variable was used in the analyses that are reported in chapter 3.

Labor Market Conditions

Entry into the labor market is for many students an alternative to postsecondary schooling, and labor market opportunities may influence educational decisions. The unemployment rate for the area in which the respondent lived was used as an indicator of labor market conditions. If the respondent lived within a Standard Metropolitan Statistical Area (SMSA), the unemployment rate for the SMSA was used. The unemployment figure for the rest of the state was used if the place of residence was non-SMSA. Data were obtained from Employment and Earnings (U.S. Department of Labor, Bureau of Labor Statistics, 1979).

Form of the Analyses

The measures of successful postsecondary participation were analyzed through a series of regression equations to test both the adequacy of the models specified by the equations and to determine the effects of the explanatory variables. Two analyses were undertaken. The first was based on the model of figure 1 and was comparable to the approach taken by Meyer (1981). The second attempted to replicate Gelb's (1979) analysis with a different data set.

The model of figure 1 can be represented in a three-equation system, which is assumed for simplicity to be linear:

$$(1)\quad Y = a_0 + a_1X + a_2Z + a_3A + a_4P + e_a$$

$$(2)\quad P = b_0 + b_1X + b_2A + e_b$$

$$(3)\quad A = c_0 + c_1X + c_2P + e_c$$

where Y = a measure of postsecondary participation

P = a 5-element vector of patterns of participation in high school vocational education

A = a measure of educational aspiration

X = a k-element vector of individual and contextual attributes, such as residence, socioeconomic origins, and academic ability

Z = a j-element vector of local labor market conditions that are relevant to a choice between labor market participation and continuing education

e = random disturbance terms that reflect unmeasurable influences in each equation

Only equation (1) can be estimated, since (2) and (3) cannot be distinguished from each other in estimation without imposing some additional restrictions on elements of the coefficient vectors b_1 and c_1.* Unless there is some unexpected source of correlation of residuals across equations, as long as a measure of aspirations is available, equation (1) can be estimated consistently by ordinary least squares (OLS).** But the exact properties of the estimates depend on the form of Y, the outcome variable to be explained.

In the first analysis, Y is a four element vector of dichotomous variables that indicate participation in one of the four categories of postsecondary educational experience--no education, two-year programs, four-year programs, and other training programs--as described in the preceding section. This form of specification is known as a linear probability model. For linear probability models, OLS is not an efficient method of estimation and standard tests of significance are not strictly appropriate because e_a has a heteroskedastic and nonnormal distribution. The linear probability model has advantages, however, that argue strongly for its use in cases (like the present one) in which the mean values of Y over the sample are not too close to their limits, 0 or 1. The advantages include lower cost of estimation, simplicity of data preparation, ease of interpretation of estimated coefficients, and the facility with which more complex conditional probabilities can be derived by simple addition from the estimated equations. For an explanation of the linear probability model, see Pindyck and Rubinfeld (1976).

In the second analysis Y is measured on a four-point scale, as described above, with no postsecondary education receiving a score of 0, postsecondary vocational, 1; two-year college, 2; and four-year college, 3. In this case, also, OLS is not a strictly appropriate method of estimation. Because the range of the dependent variable is limited, e_a again has a heteroskedastic and nonnormal distribution. A more serious problem rests with the interpretation of the scale: it is ordinal, and it is not at all clear that equal numerical distances along the scale are in any sense equivalent. If they are not, regression analysis may

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* Moreover, the data are not available to estimate the relationships between curriculum and aspirations properly. For an interesting attempt at estimating the dynamics of aspirations, see Hotchkiss (1981).

** See Meyer (1981) for an excellent discussion of the problems that arise when no measure of A is available.

be quite misleading. Gelb (1979) argues that his analysis justifies his interpretation of equal distances along the scale as equivalent. The authors of the present report are not convinced that this equivalence has been established, but they believe that Gelb's results, if valid, have sufficiently important implications for policy that his approach should be tried on a different data set and its results compared with those from other approaches.

The aspirations variable, A, is measured in two ways. The first is on a continuous scale in terms of years of education. The second is as a set of four dichotomous variables indicating a desire for fourteen, fifteen, or sixteen, more than sixteen years of education, or a desire for additional postsecondary training other than formal schooling. The dichotomous variables allow for nonlinear effects of aspirations and are thus more flexible than the simple scale of years. When the set of dichotomous variables is used, the reference group for the estimation is implicitly those former students who have aspirations for less than fourteen years of education (and do not aspire to other forms of postsecondary training such as apprenticeship).

The indicators of high school curriculum are a set of dichotomous variables that identify a respondent's participation in high school vocational education as a Concentrator, Limited Concentrator, Concentrator/Explorer, Explorer, or Incidental/ Personal. The patterns of participation were described in more detail previously. The reference group for this set of variables consists of those respondents who have had no vocational education in high school. Of the sample 3056, 627 fall into this reference group. Hence, the estimates of the elements of a_4 estimate the <u>difference</u> between the effects of the patterns of participation in vocational education and the effect of education without a vocational component. It is not possible here to estimate an <u>absolute</u> effect of participation in vocational education on postsecondary educational attainment.

A final comment is in order concerning the interpretation of the estimated coefficients. Estimates of these elements of a_4 are estimates of the <u>direct</u> effects of vocational education when aspirations are controlled. A finding that a_4 did not differ significantly from zero would not rule out the possibility that, if a_3 differed from zero, high school curriculum could have <u>indirect</u> effects on postsecondary attainment that operate through aspirations. This finding would support what Grasso and Shea (1979) called the "tracking model." A symmetrical statement holds regarding the possible indirect effect of aspirations operating through curriculum choice. This finding would support the "goal-directed" model of Grasso and Shea. If both a_3 and a_4 differ significantly from zero, one cannot rule out the possibility of indirect effects for both curriculum and

aspirations. As noted above, because (2) and (3) cannot be estimated here, the hypotheses regarding indirect effects cannot be tested. The results obtained from those equations that could be estimated are presented in the next chapter, together with cross-tabulations of the postsecondary experience.

CHAPTER THREE

RESULTS AND RECOMMENDATIONS

As outlined in the previous chapter, several analytic techniques were applied to the data in order to provide some insight into the three research questions posed in the introduction. The purpose of this chapter is to present the results of these analyses, to link the findings and the questions of interest, and to discuss the relevance and applicability of the findings to vocational education policy. First, cross-tabulations that provide estimates of the proportions of high school graduates continuing their education and the kind of education pursued are presented. Second, the findings relating successful postsecondary experience to various explanatory variables are provided. Finally, the results of replications of two other studies are discussed. The concluding section of the chapter deals with the policy implications of these results.

Enrollment in Postsecondary Institutions

Table 3.1 presents the postsecondary enrollment statistics of youth in each of the vocational pattern groups. The enrollment categories range from no postsecondary participation to enrollment in a four-year college or university. Because the variable is based on enrollment rather than satisfactory completion, the data do not reflect the length of time spent in the program, the degree of movement between different types of schooling, or the level of success in postsecondary education. In addition, if a respondent had participated in more than one type of postsecondary option, that person was placed in the highest category. Therefore, within each of the pattern groups, the most extensive level of involvement in postsecondary education is reported. Another complicating factor arises from the technique of cross-tabular analysis. This method limits the introduction of additional variables that may contain important influences on the question being studied. In essence, cross-tabular analysis is relatively unconditional and, in this case, only reflects the percentage of students continuing their education without consideration of other factors, such as educational aspirations or parents' education. The data do, however, provide an overall picture of enrollment in postsecondary institutions.

TABLE 3.1

ENROLLMENT IN POSTSECONDARY EDUCATION BY
PATTERNS OF VOCATIONAL PARTICIPATION

Type of Postsecondary Education	Pattern of Participation						
	Concentrator	Limited Concentrator	Concentrator/ Explorer	Explorer	Incidental/ Personal	Non-vocational	Total
No postsecondary	43.7%	35.6%	37.5%	34.8%*	24.6%	22.1%	29.5%
Training program or institute	20.7%	17.8%	10.9%	13.6%*	8.3%	6.7%	11.3%
Two-year college or university	17.0%	20.0%	21.5%	29.3%*	19.1%	16.9%	18.9%
Four-year college or university	18.6%	26.6%	30.1%	22.3%*	48.1%	54.3%	40.2%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
(N)	(327)	(550)	(315)	(43)	(1148)	(672)	(3054)

NOTE: The percentages in the table represent the weighted distribution of cases; the percentages may not sum to 100 due to rounding. The numbers in parentheses denote the reallocated, unweighted sample size, which is based on the weighted distribution of cases. The asterisk (*) indicates that the category number is less than twenty-five actual cases. Missing cases are excluded.

The data show that a majority of high school graduates enroll in some type of postsecondary education. The extent of involvement in further education, however, varies significantly between the pattern groups. For example, nearly 78 percent of the graduates without any vocational experience had engaged in some type of continued schooling, compared to 56 percent of the Concentrators, or youth who received the most extensive amount of vocational exposure in high school. Postsecondary enrollment among the other pattern groups ranges from 64 and 63 percent for Limited Concentrators and Concentrator/Explorers to 75 percent for Incidental/Personal graduates. (Explorers are excluded from the discussion because of the small number of cases.) Notably, substantial differences in the proportion of youth enrolled in some type of postsecondary education occur at two points: between Concentrators and the Limited Concentrator - Concentrator/Explorer combination, and between this latter group and the Incidental/Personal - nonvocational combination. In general, as the level of participation in vocational education increases, the likelihood of enrollment in postsecondary education decreases. This finding is not unexpected, and the general trend is consistent with the results of similar studies when other explanatory variables are not considered.

Closer examination of table 3.1 reveals that there are also important differences among the pattern groups in the kind of postsecondary education pursued. With the exception of the Concentrator pattern, a plurality of youth who attend a postsecondary institution enter a four-year college; Concentrators exhibit a slightly greater tendency to enroll in a technical training institution. The proportion of youth who engage in postsecondary work at a four-year college increases dramatically as participation in vocational education decreases. Over one-half of the nonvocational graduates were assigned to this category, compared to 19 percent of the Concentrators. Interestingly, smaller differences are found for enrollment in two-year colleges. Concentrators and nonvocational graduates exercise this educational option in nearly equal proportions, about 17 percent of each group, and the percentages of youth in this category in the remaining three patterns are within 3 percentage points difference.

As mentioned above, Concentrators who extend their education beyond high school are most likely to do so in a technical training program outside traditional academia. Approximately one-fifth of these respondents had been enrolled in one of the training options that comprise this category--business college, nurse's program, apprenticeship program, vocational-technical institute, barber or beauty school, or company training program. When the other pattern groups are considered, the proportion of youth participating in postsecondary work at this level decreases. Nonvocational and Incidental/Personal graduates are

least likely to enroll in a post-high school technical training program, compared to youth who had more extensive involvement in secondary vocational education.

Given the limitations of the enrollment variable, any conclusions drawn from the data should be made with caution. Overall there is sufficient evidence to indicate that there are differences among the pattern groups in the frequency of postsecondary enrollment and in the kind of activity pursued. However, in order to assess more adequately the success of former vocational students in postsecondary academia or training, a more rigorous definition of postsecondary education is needed. As discussed in chapter 2, a variable labeled "successful postsecondary experience" was constructed to deal with the problems encountered with the traditional indicators such as enrollment.

Successful Postsecondary Experience, Class Rank, and Patterns of Vocational Participation

In table 3.2, the pattern groups were combined with a measure of academic ability (e.g., class rank) and are shown in a cross-tabulation with the postsecondary variable indicating successful completion or current enrollment in one of three educational options. Academic ability, as indicated by class rank, was included here because it has demonstrated an important effect on further education in other studies. For this analysis, class rank was divided into low and high categories at the midpoint of the scale, there being no apparent logic supporting an alternative division. The table shows the percentage distribution of each pattern/class rank group within each of the postsecondary categories. The percentages are, however, rank ordered in each of the columns, in order to show the differences between the pattern groups and to identify any possible trends in the data.

Unlike the data in the previous table, which showed that a majority of youth in each of the pattern groups have been enrolled in postsecondary education or training, a successful postsecondary experience of one type or another appears to be more heavily dependent upon ability. The summary column (i.e., Some Type of Postsecondary Participation) provides an estimate of the relative percentage of youth who met the successful postsecondary criteria. Without exception, graduates of higher class rank are most likely to continue their education regardless of their secondary vocational experience. For example, within each of the low-class-rank groups, fewer than 50 percent could be classified as engaged in successful postsecondary education. There are, of course, differences among the pattern groups, but academic ability appears to be a decisive factor in whether or not a student will successfully pursue further education.

TABLE 3.2

SUCCESSFUL COMPLETION OR CURRENT ENROLLMENT IN POSTSECONDARY EDUCATION BY PATTERNS OF VOCATIONAL PARTICIPATION AND CLASS RANK (PERCENTAGE DISTRIBUTION)

Four-Year College or University			Two-Year College			Training Program or Institute			Any Type of Postsecondary Education		
Pattern	Class Rank	(%)	Pattern	Class Rank	(%)	Pattern	Class Rank	(%)	Pattern	Class Rank	(%)
NV	high	(64.4)	CE	high	(19.9)*	C	low	(29.7)	NV	high	(80.3)
IP	high	(52.0)	E	high	(16.4)*	E	high	(27.2)*	E	high	(72.2)*
LC	high	(34.5)	LC	high	(16.2)	LC	low	(22.3)	IP	high	(71.5)
E	high	(28.7)*	CE	low	(13.5)*	E	low	(21.1)*	LC	high	(61.6)
CE	high	(24.7)	NV	low	(13.5)	C	high	(19.7)	CE	high	(60.7)
C	high	(22.5)	IP	high	(12.4)	CE	high	(16.2)*	C	high	(54.2)
IP	low	(19.6)	C	high	(12.0)	IP	low	(15.6)	IP	low	(46.8)
NV	low	(18.0)	IP	low	(11.6)	LC	high	(10.9)	NV	low	(40.2)
CE	low	(9.7)*	NV	high	(9.0)	CE	low	(10.2)*	E	low	(36.8)*
E	low	(7.9)*	E	low	(7.8)*	NV	low	(8.8)*	C	low	(36.3)
LC	low	(6.7)*	LC	low	(7.2)*	IP	high	(7.1)	LC	low	(36.1)
C	low	(1.4)*	C	low	(5.2)*	NV	high	(7.0)*	CE	low	(33.6)
Total		(31.4)			(11.8)			(13.0)			(56.2)

NOTE: The weighted percentages in the table are rank ordered within each column and represent the percentage of each group, as defined by pattern and class rank. The asterisk (*) indicates that the cateqory n is less than twenty-five actual cases. Missing cases are excluded. The readjusted sample size for each group is shown below (total N = 2487).

Symbol	Pattern	Class Rank	N	Symbol	Pattern	Class Rank	N
C	Concentrator	Low	104	E	Explorer	Low	22
	Concentrator	High	162		Explorer	High	12
LC	Limited Concentrator	Low	241	IP	Incidental/Personal	Low	425
	Limited Concentrator	High	204		Incidental/Personal	High	547
CE	Concentrator/Explorer	Low	124	NV	No Vocational Credits	Low	216
	Concentrator/Explorer	High	112		No Vocational Credits	High	321

Approximately 80 percent of the high-class-rank, nonvocational youth had some type of successful postsecondary experience compared to 54 percent of the high-class-rank Concentrators and 61 and 62 percent, respectively, of the Concentrator/Explorers and Limited Concentrators.

The second area in which class rank shows a substantial effect is in the four-year college or university category. Students of high-class-rank and, in general, those with less vocational education, were most likely to elect this option. If the percentages of high and low class rank across the various pattern groups are considered, the data show that approximately 80 percent of the secondary graduates in four-year schools were of high class rank. Nonvocational, high-class-rank graduates were almost three times as likely to meet the criteria for this category as high-class-rank Concentrators. Slightly more than half of the high-class-rank, Incidental/Personal graduates had completed or were enrolled in four-year colleges, compared to one-fourth of the Concentrator/Explorers. Suprisingly, Limited Concentrators of high class rank--the pattern group with a substantial involvement in vocational education--were ranked higher, in terms of the relative percentage within the defined groups, than Concentrator/Explorers of similar academic ability. Among youth of lower class standing, completion or enrollment in four-year colleges ranges from slightly less than 20 percent, nonvocational and Incidental/Personal youth, to less than 10 percent within the remaining pattern groups.

Class rank does not appear to have as dominant an influence on other types of postsecondary education, specifically two-year colleges and training programs. There are, for example, no clear-cut patterns in the data for attendance in two-year colleges. Disregarding class rank and examining respondents in each of the pattern groups in two-year schools (data not shown in the table), the percentage of graduates choosing this option does not deviate from the mean of 11.5 percent by more than 3.5 percentage points. Concentrator/Explorers most frequently (15 percent) reported a successful experience in two-year colleges.

Postsecondary technical training programs, however, appear to be a viable option for many former vocational students. Among low-class-rank Concentrators in particular, this was the most frequent type of postsecondary option exercised. Approximately 30 percent of the respondents in this group were identified as having completed or being currently enrolled in a training program or institute. In addition, over 22 percent of the Limited Concentrators of low class rank were classifiied in this category. Overall, a majority, 58 percent, of those in technical training programs were of low class rank. This finding is a departure from the class rank statistics for the other postsecondary categories. As expected, high-class-rank Incidental/

Personal and nonvocational graduates were the least likely groups to engage in a training program.

Several tentative conclusions can be drawn from an examination of both the enrollment and successful postsecondary experience tables. The enrollment table reflects the fact that an individual was at some time enrolled in a postsecondary program. Whether the experience was sucessful or not is unknown. Therefore, the count includes those with both kinds of experiences, and will be higher than a count including only successful experiences. Although the successful postsecondary experience variable in this study also includes some students who might eventually drop out, it is not as inflated as enrollment alone. Rather, it includes only those who have successfully completed any postsecondary program approximating work of an academic year or more, or who were still engaged in such a program at the time of the interview. For example, approximately 40 percent of all graduates were enrolled at some time in four-year schools, compared to 31 percent who met the criteria for successful completion or enrollment in the same. Comparable estimates for the two-year college category are approximately 19 and 12 percent.

Vocational education, and perhaps more significantly, class rank, seem to influence whether or not graduates continue their education and, in particular, their attendance in four-year colleges. More extensive involvement in vocational education and lower class rank tend to depress the possibility of enrolling in or completing a four-year academic program. Not only were high-class-rank nonvocational and Incidental/Personal graduates the most likely groups to achieve some type of postsecondary attainment but a majority of each group was pursuing four-year degrees. Completion or enrollment in other postsecondary areas, especially technical training institutions, was markedly reduced. In comparison, low-class-rank Concentrators and Limited Concentrators were the least likely groups to further their education, and they show minimal participation in two- and four-year academic settings. When youth of low class rank and extensive involvement in vocational education do choose to continue their schooling, they generally do so in technical training programs or institutions.

Interpretation of these findings suggests several possibilities. Selection of a bachelor's program over a training program by nonvocational and Incidental/Personal students appears to reflect differences in educational and occupational goals that are screened through the curriculum variable. That is, nonvocational and Incidental/Personal youth prepare for a collegiate career by concentrating their course work in high school in academic subjects, rather than vocational classes. On the other hand, it is also possible that youth have not finalized their postsecondary plans prior to selecting a course of study in high school, and the curricular experience influences their subsequent educational decisions.

High-class-rank Concentrator/Explorers and Explorers are fairly diversified in their selection of the postsecondary choices; the within-group percentages are ranked near the top of each postsecondary category. In addition, Incidental/Personal graduates of low class rank and Concentrators with a high class rank were diverse in their distributions among the education types and both groups appear to participate successfully in four-year and two-year colleges and in training programs in relatively similar proportions. These patterns, although less striking than those discussed above, suggest that a vocational background that is less extensive (i.e., Concentrator/Explorers and Explorers) or one that is mediated by high academic ability (Concentrators with a high class rank) are less likely than other combinations of patterns and class rank to direct students to a particular type of postsecondary education.

It should be recognized that the evidence from simple cross-tabulations regarding the relationship between vocational education and postsecondary participation may omit important conditions. While in some cases the data show very clear patterns for these effects, the method does not take into account other factors that may be correlated with high school curriculum and may affect postsecondary schooling as much as or more than high school curriculum or class rank. To provide a more comprehensive picture of the influences on postsecondary education, a series of linear probability models was estimated, using several dependent variables indicating successful postsecondary experience. These results are presented in the next section.

Linear Probability Models of Successful Postsecondary Participation

For white males, minority males, white females, and minority females, separate linear probability models were estimated for successful participation in two-year college, four-year college, and any postsecondary education program. Those estimates are presented in tables 3.3 though 3.7 (pp. 37 through 46). Several specifications were estimated for each of the four race/sex groups, but estimates for only one specification are presented in the tables. Results from other specifications are alluded to in the subsequent discussion where they aid in the interpretation of results. The detailed estimates for all specifications mentioned were conducted by the authors but are not included in this report.

The estimates shown in tables 3.3 through 3.7 include variables that reflect all of the forces mentioned in chapter 1 as affecting educational choices. They include contextual attributes, individual attributes (including the home environment), local labor market conditions, and aspirations. The principal

concern in this study is with the effects of participation in vocational education on postsecondary educational attainment. The effects of the other influences can be discussed briefly, before the effects of vocational participation are considered in more detail.

The region of the country and the degree of urbanization of the respondent's residence did not have a major impact on successful postsecondary participation. The differences between urban and rural areas were apparent only when aspirations were excluded from the equation. (The exception is that white females from rural areas were more likely to attend four-year colleges than were their urban counterparts.) When aspirations were excluded, rural residents were estimated to be about 3 to 7 percent less likely to participate in any kind of postsecondary program. These estimates suggest that rural residents are less likely to aspire to postsecondary education. The only consistently significant pattern by region of residence was for the West (again with the exception of white females attending four-year colleges). Western residents regardless of race or sex were less likely to participate in four-year college programs. The magnitude of the effects ranges from 6 to 16 percent. Conversely, all western residents except white males were more likely than their counterparts in other regions to attend two-year colleges. How much of this effect is attributable to California's extensive system of community colleges and their tuition and admission policies could not be determined in the time available to complete this study. But the authors suspect that the influence is substantial.

Parents' education was a significant factor in explaining postsecondary participation for whites but not for minority respondents. The effects are clearly bound up with aspirations, for the estimated effects of father's education were reduced by half and the effects of mother's education practically disappeared when aspirations variables were added to the equation. When the white respondent's father had completed twelfth grade or a higher grade, the respondent was more likely to have any of the three forms of postsecondary participation shown in the tables. For the four-year college programs for whites, the likelihood of participation increased with increases in the father's educational level. For two-year programs, respondents whose fathers had completed twelve or more years of education were more likely to participate than were respondents whose fathers had less than twelve years of education. But the increase in the likelihood was greater when the father had exactly fourteen years of education than when he had either more or less. When aspirations were omitted, for all respondents except minority males, higher levels of mother's education had progressively greater impacts, similar to those for father's education, on the likelihood of four-year college participation. But the effects did not remain significant when aspirations were added to the equation.

The respondent's rank in high school class contributed significantly to explaining participation in four-year college programs and in any postsecondary program. It was not related to two-year programs for any group of respondents. As with parents' education, inclusion of aspirations variables reduced by nearly half for whites, and one-third for minorities, the estimated coefficient for class rank. An increase of 10 percent in the relative class rank increased the likelihood of four-year college participation by about 3 percentage points for all respondents.

Whether the respondent's mother worked for pay outside the home when the respondent was fourteen was a significant factor only for minority males. But an interesting pattern emerges, nevertheless. Working mothers were associated with a 1 or 2 percent lower likelihood of attending a four-year college, and with a 2 or 3 percent higher likelihood of attending two-year college programs. For minority males, working mothers were associated with a significant 12 percent lower likelihood of four-year college participation.

The number of siblings was significant only for white females, and in that case, each additional sibling reduced by 1 percent the likelihood of participation in a four-year college program. This result may suggest that the traditional tendency for large families to send males rather than females to four-year colleges may not have completely disappeared. Whatever the explanation, the effects are not dramatic.

Because of the variation in the ages of the respondents and the relationship between age and opportunity for postsecondary experience, the respondent's age was included among the explanatory variables in the linear probability equations.* If the dependent probabilities had been defined to reflect <u>any current or prior participation</u> rather than only <u>successful participation or current enrollment</u>, one would expect older respondents to be more likely to have had some experience merely because they had more opportunities than younger respondents. Because the dependent probabilities were defined as successful participation or current enrollment, however, relatively more older respondents than younger respondents will already have had unsuccessful postsecondary experiences, will have dropped out, and thus will not meet the criteria for successful postsecondary experience. Many younger respondents who will not complete postsecondary programs will still be enrolled at the time of the

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* See table 2.1 for the size of each cohort by years since graduation.

most recent interview and thus will fall into the classification of successful postsecondary participation. This pattern would be expected to show a negative relationship between age and successful participation. That expectation is realized for all respondents except white males attending four-year colleges. Only for minority respondents, however, did the estimates achieve statistical significance.

The local area unemployment rate was used as an indicator of local labor market conditions. Ideally, one would like a summary measure of those conditions over the entire period since the respondent's high school graduation. But the only information that could be compiled in the time that was available for this study was the local unemployment rate. Higher rates of unemployment were, as expected, associated with a higher likelihood of successful postsecondary participation for minority males. For white females higher unemployment rates were associated with a lower likelihood of successful postsecondary participation. Although this hypothesis could not be tested here, the direction of the effect would make sense if women were primarily secondary labor force participants who were more likely to seek employment rather than attend school if their husbands were unemployed. That explanation would have seemed more reasonable if it had been applied ten or fifteen years ago to a sample of married women. The authors do not have a satisfactory explanation of that significant coefficient for a 1980 sample that includes many unmarried women. More investigation is called for here.

The aspirations measures were strongly significant for all respondents in all three categories of postsecondary participation. Moreover, the patterns of the aspirations coefficients conformed to expectations in all instances. Higher levels of aspirations were associated with successively higher probabilities of successful participation in four-year college programs or in all postsecondary programs considered as a group. Respondents who aspired to exactly fourteen years of education were more likely to participate successfully in two-year college programs than were respondents who aspired to either more or fewer years of education. But respondents who aspired to more than fourteen years were still more likely to participate successfully in two-year postsecondary programs than were respondents who aspired to fewer than fourteen years of education.

In summary, the linear probability models explain a relatively high proportion of successful participation in four-year college programs and in all postsecondary programs considered as a group. They explain only a small proportion of the participation in two-year college programs. Nonetheless, those influences other than participation in high school vocational education seem to be captured fairly well by the

linear probability models. The effects of participation in vocational education are considered next.

It has frequently been argued that participation in secondary vocational education discourages the pursuit of postsecondary education. The NLS Youth data set does not generally support that allegation. Vocational education is associated with less frequent participation in four-year college programs and more frequent participation in two-year college programs.

For white males, Concentrators are significantly less likely than other respondents with no vocational credits to successfully participate in four-year college programs. But four out of five of the vocational participation patterns are associated with greater participation in some form of postsecondary program, and all five patterns are associated with greater participation in two-year programs. The associations are significant only for Limited Concentrators for all postsecondary programs and for Concentrators/Explorers for two-year programs. But these data clearly do not support the allegation that vocational participation discourages postsecondary participation in general.

White females exhibited a pattern similar to white males for the two-year and four-year programs, except that only for Concentrator/Explorers in four-year programs was the estimated coefficient significantly different from zero. The difference for females was that the coefficients for participation in any postsecondary program were negative for women, although none differed significantly from zero.

For minority male respondents there was a more consistent relationship between vocational education and a lower likelihood of postsecondary participation. Almost all patterns of vocational participation were negatively associated with participation in each of the three types of postsecondary programs. Statistically significant effects were found only for Explorers for any postsecondary programs, Concentrators for four-year college programs, and Concentrator/Explorers for two-year college programs. For minority women, relationships were similar in direction but less pronounced for most patterns and postsecondary programs. An important exception was evident with Concentrators among minority females, for they were associated with greater postsecondary participation for all three postsecondary programs. None of those estimates for minority females, however, achieved statistical significance. The estimates convey only impressions. They do not identify strong tendencies for these groups of students.

Because the aspirations variables were included in the equations, the coefficients of vocational patterns are estimates of the direct effect of that participation on postsecondary

TABLE 3.3

EXPLANATORY VARIABLES IN TABLES 3.4 THROUGH 3.7 AND 3.10

Abbreviation	Explanation
C	= 1 if respondent is a Concentrator
LC	= 1 if respondent is a Limited Concentrator
CE	= 1 if respondent is a Concentrator/Explorer
E	= 1 if respondent is an Explorer
IP	= 1 if respondent is an Incidental/Personal participant
RANK	= respondent's position in high school class at graduation by total number in the high school class
AGE	= respondent's age at the 1980 interview
UNEMP	= local unemployment rate in percentage points
ASPIRE 14 (16, 17)	= 1 if respondent aspires to more than 12 but not more than 14 (more than 14 but not more than 16, more than 16) years of education
FA ED 12 (14, 16, 17) MO ED 12 (14, 16, 17)	= 1 if parents' education was exactly 12 (more than 12 but not more than 14, more than 14 but not more than 16, more than 16) years
RURAL	= 1 if respondent resided in a rural area at the time of the 1980 interview

TABLE 3.3
(Continued)

EXPLANATORY VARIABLES IN TABLES 3.4 THROUGH 3.7 AND 3.10

Abbreviation	Explanation
NEAST, SOUTH, WEST	= 1 if respondent resided in that region at the time of the 1980 interview
MOWORK	= 1 if mother worked for pay outside the home when respondent was age 14
NSIB	= number of respondent's siblings
MISSING DATA INDICATORS	= 1 if data were unavailable for the corresponding variable for that respondent (entry for corresponding variable was set to zero)
PCTVOC	= percentage of a respondent's high school courses that were vocational, in percentage points from 0 to 100

TABLE 3.4

FACTORS AFFECTING THE PROBABILITY OF
A SUCCESSFUL POSTSECONDARY EDUCATION EXPERIENCE:
WHITE MALES

	Any	Four-Year College	Two-Year College
C	.02 (.35)	-.10 (2.13)**	.02 (.59)
LC	.11 (2.38)**	.00 (.10)	.05 (1.40)
CE	@	-.05 (1.11)	.09 (2.11)**
E	.10 (.89)	.02 (.23)	.06 (.84)
IP	.02 (.62)	-.02 (.81)	.01 (.33)
RANK/100	.23 (3.93)**	.28 (5.85)**	.06 (1.51)
AGE	@	@	@
AGE 2/109	-.02 (.94)	.02 (1.16)	-.01 (.84)
UNEMP	.00 (.29)	-.01 (1.53)	.01 (1.23)
ASPIRE 14	.10 (2.21)**	.02 (.44)	.15 (4.90)**
ASPIRE 16	41 (10.40)**	.47 (14.69]**	.10 (3.56)**
ASPIRE 17	.49 (10.13)**	.61 (15.36)**	.08 (2.25)**
RURAL	-.02 (.59)	-.00 (.94)	-.02 (.82)
NEAST	.04 (1.01)	.03 (1.08)	.19 (.70)
SOUTH	-.00 (.03)	-.04 (1.38)	-.00 (.18)
WEST	-.08 (1.67)*	-.11 (2.97)**	-.00 (.15)
FA ED 12	.13 (3.31)**	.05 (1.40)	.01 (.25)
FA ED 14	.14 (2.60)**	.00 (.10)	.07 (1.77)*
FA ED 16	.16 (2.88)**	.10 (2.33)**	.06 (1.48)
FA ED 17	16 (2.63)**	.09 (1.86)*	.06 (1.32)
MO ED 12	-.09 (2.15)**	-.00 (.05)	.00 (.14)
MO ED 14	-.95 (.74)	.04 (.79)	-.02 (.49)
MO ED 16	-.01 (.20)	.05 (1.08)	.03 (.68)
MO ED 17	-.09 (1.94)	-.02 (.31)	.03 (.47)
MOWORK	-.02 (.54)	-.01 (.28)	.02 (1.02)
NSIB	-.01 (1.62)	-.01 (1.44)	.01 (1.03)
Missing Data for:			
RANK	-.17 (3.59)**	-.11 (2.85)**	-.08 (2.36)**
FA ED	.11 (1.37)	-.07 (1.02)	.06 (.97)
MO ED	-.15 (1.71)**	.02 (.34)	-.08 (1.31)
MOWORK	.07 (.53)	.03 (.25)	.00 (.01)
NSIB	-.57 (1.32)	.04 (.12)	-.19 (.61)
ASPIRE	.25 (1.41)	@	.15 (1.19)
CONSTANT	.52 (4.15)	.18 (1.76)	.02 (.22)

TABLE 3.4
(Continued)

	Any	Four-Year College	Two-Year College
N	930	930	930
R^2	.39	.50	.07
Adj. R^2	.28	.48	.04
F	13.00	28.79	2.23

NOTES: Numbers in parentheses are t-statistics. Dependent variable takes on values of either 0 or 1 for each observation.

* Significant at .10 level
** Significant at .05 level
@ Stepwise procedure excluded this variable because its F-value < .005

TABLE 3.5

FACTORS AFFECTING THE PROBABILITY OF
A SUCCESSFUL POSTSECONDARY EDUCATION EXPERIENCE:
MINORITY MALES

	Any	Four-Year College	Two-Year College
C	-.94 (.45)	-.14 (2.11)**	-.07 (1.13)
LC	08 (1.07)	-.05 (.91)	-.01 (.27)
CE	-.12 (1.43)	-.01 (.18)	-.14 (2.32)**
E	-.33 (2.00)**	-.18 (1.38)	-.07 (.57)
IP	-.02 (.27)	.02 (.49)	-.05 (1.24)
RANK/100	.37 (3.79)**	.36 (4.51)**	@
AGE	@	@	@
AGE 2/100	-.09 (2.33)**	-.02 (.69)	-.06 (2.14)**
UNEMP	.02 (1.96)**	.02 (2.59)**	.00 (.49)
ASPIRE 14	.16 (2.31)**	-.01 (.09)	.17 (3.30)**
ASPIRE 16	.38 (6.57)**	.23 (4.95)**	.13 (3.21)**
ASPIRE 17	.55 (7.33)**	.54 (8.81)**	.08 (1.55)
RURAL	.00 (.07)	-.04 (.77)	.04 (.74)
NEAST	.02 (.20)	.05 (.07)	-.03 (.49)
SOUTH	-.02 (.34)	-.03 (.51)	.01 (.30)
WEST	.01 (.08)	-.16 (2.84)**	.10 (1.81)*
FA ED 12	-.00 (.95)	-.04 (.87)	-.04 (.82)
FA ED 14	-.09 (.91)	.03 (.41)	-.07 (.86)
FA ED 16	.08 (.69)	.02 (.25)	.05 (55)
FA ED 17	-.16 (.99)	-.19 (1.41)	.06 (.48)
MO ED 12	-.08 (1.48)	-.01 (.19)	.02 (.41)
MO ED 14	-.15 (1.64)	.08 (1.15)	-.07 (1.05)
MO ED 16	.04 (.38)	.03 (.32)	-.01 (.17)
MO ED 17	.02 (.09)	.04 (.24)	-.03 (.21)
MOWORK	-.03 (.55)	-.12 (3.27)**	.03 (.77)
NSIB	@	-.01 (1.03)	-.01 (1.26)
Missing Data for:			
RANK	-.30 (3.75)**	-.25 (3.92)**	-.02 (.42)
FA ED	-.05 (.73)	-.06 (1.16)	-.01 (.29)
MO ED	-.08 (.70)	.05 (.53)	-.06 (.70)
MOWORK	.30 (1 41)	-.26 (1.52)	.38 (2.43)**
NSIB	-.01 (.79)	.10 (.27)	-.10 (.31)
ASPIRE	-.39 (1.17)	-.02 (.07)	-.17 (.70)
CONSTANT	.83 (3.91)	.46 (2.72)	.31 (2.04)

TABLE 3.5
(Continued)

	Any	Four-Year College	Two-Year College
N	417	417	417
R^2	.29	.39	.11
Adj. R^2	.24	.35	.04
F	5.32	8.08	1.61

NOTES: Numbers in parentheses are t-statistics. Dependent variable takes on values of either 0 or 1 for each observation.

* Significant at .10 level
** Significant at .05 level
@ Stepwise procedure excluded this variable because its F-value < .005

TABLE 3.6

FACTORS AFFECTING THE PROBABILITY OF
A SUCCESSFUL POSTSECONDARY EDUCATION EXPERIENCE
WHITE FEMALES

	Any	Four-Year College	Two-Year College
C	-.01 (.21)	-.03 (.88)	.02 (.43)
LC	-.01 (.16)	-.04 (1.11)	.00 (.11)
CE	-.02 (.49)	-.06 (1.72)*	.03 (.67)
E	.05 (.44)	-.09 (.97)	.02 (.26)
IP	-.01 (.15)	-.02 (.65)	.02 (.71)
RANK/100	25 (4.44)**	.30 (6.86)**	.01 (.32)
AGE	@	@	@
AGE 2/100	-.03 (1.21)	-.01 (.65)	-.02 (1.28)
UNEMP	-.01 (1.37)	-.01 (2.09)**	.00 (.67)
ASPIRE 14	.20 (5.66)**	.02 (.85)	.20 (6.96)**
ASPIRE 16	.50 (13.88)**	.43 (15.11)**	.21 (7.03)**
ASPIRE 17	.56 (12.66)**	.65 (18.58)**	.11 (2.94)**
RURAL	.04 (1.41)	.07 (2.91)**	-.03 (1.23)
NEAST	.02 (.44)	.06 (2.10)**	.02 (.85)
SOUTH	-.09 (2.55)**	-.03 (1.07)	.01 (.41)
WEST	-.04 (1.01)	-.10 (3.17)**	.08 (2.62)**
FA ED 12	-.01 (.26)	.01 (.33)	-.00 (.11)
FA ED 14	.08 (1.58)	.04 (.93)	.03 (.62)
FA ED 16	.09 (1.98)**	.10 (2.68)**	.01 (.14)
FA ED 17	.11 (2.10)**	.16 (3.65)**	-.02 (.42)
MO ED 12	-.01 (.31)	.01 (.44)	-.04 (1.53)
MO ED 14	-.02 (.30)	.02 (.54)	-.01 (.19)
MO ED 16	-.04 (.79)	.07 (1.63)	-.13 (2.86)**
MO ED 17	-.97 (.84)	.12 (1.83)*	.00 (.03)
MOWORK	@	-.01 (.62)	.02 (.98)
NSIB	-.01 (1.45)	-.01 (2.30)**	.00 (.20)
Missing Data for:			
RANK	-.12 (2.97)**	-.14 (4.45)**	.01 (.32)
FA ED	-.02 (.34)	-.01 (.14)	-.03 (.61)
MO ED	-.14 (1.64)	-.11 (1.60)	.05 (.79)
MOWORK	.21 (1.64)	.12 (1.21)	.12 (1.14)
NSIB	-.32 (1.08)	-.09 (.39)	-.01 (.06)
ASPIRE	.15 (.79)	.15 (.99)	.38 (2.50)**
CONSTANT	.59 (7o.14)	.32 (3.46)	.08 (.87)

TABLE 3.6
(Continued)

	Any	Four-Year College	Two-Year College
N	1161	1161	1161
R^2	.32	.52	.09
Adj. R^2	.30	.51	.07
F	17.91	39.24	3.75

NOTES: Numbers in parentheses are t-statistics. Dependent variable takes on values of either 0 or 1 for each observation.

* Significant at .10 level
** Significant at .05 level
@ Stepwise procedure excluded this variable because its F-value < .005

TABLE 3.7

FACTORS AFFECTING THE PROBABILITY OF
A SUCCESSFUL POSTSECONDARY EDUCATION EXPERIENCE:
MINORITY FEMALES

	Any	Four-Year College	Two-Year College
C	.03 (.40)	.05 (.74)	.05 (.77)
LC	-.06 (.83)	-.02 (.29)	-.00 (.04)
CE	-.12 (1.59)	.01 (.12)	-.01 (.20)
E	-.38 (2.36)**	-.17 (1.23)	-.15 (1.13)
IP	.01 (.11)	.04 (.80)	-.02 (.40)
RANK/100	.32 (3.75)**	.32 (4.42)**	-.01 (.15)
AGE	@	@	@
AGE 2/100	-.07 (2.07)**	-.06 (2.93)**	.03 (.91)
UNEMP	-.01 (.58)	-.01 (1.07)	.00 (.22)
ASPIRE 14	.25 (4.15)**	.05 (.92)	.15 (3.06)**
ASPIRE 16	.33 (5.86)**	.28 (5.83)**	.15 (3.20)**
ASPIRE 17	.42 (5.96)**	.52)**	.07 (1.24)
RURAL	-.12 (1.65)*	-)	.03 (.45)
NEAST	.06 (.700	.0	.00 (.01)
SOUTH	.11 (1.93)*	.0	.07 (1.55)
WEST	.06 (.94)	-.0	.09 (1.69)*
FA ED 12	-.03 (.47)	-.0	.03 (.65)
FA ED 14	.16 (1.67)*	-.0	.14 (1.81)*
FA ED 16	-.03 (.32)	.04	.03 (.43)
FA ED 17	-.91 (.10)	.01 (.	.01 (.09)
MO ED 12	.02 (.38)	.04 (1.9)	-.06 (1.50)
MO ED 14	.12 (1.32)	.05 (.71)	.07 (1.07)
MO ED 16	.19 (1.81)*	.07 (.73)	.03 (.39)
MO ED 17	-.07 (.40)	.00 (.01)	-.05 (.36)
MOWORK	-.0 (1.11)	-.04 (1.16)	-.00 (.08)
NSIB	- 00 (.50)	.01 (1.21)	-.00 (.01)
Missing Data for:			
RANK	-.18 (2.79)**	-.10 (1.87)*	-.07 (1.28)
FA ED	.02 (.36)	-.07 (1.50)	@
MO ED	.96 (.57)	.04 (.40)	.01 (.17)
NOWORK	-.16 (1.36)	-.15 (1.56)	.15 (1.61)
NSIB	.11 (.24)	-.39 (.97)	.77 (2.03)**
ASPIRE	.26 (.95)	.10 (.43)	-.03 (.15)
CONSTANT	.78 (4.13)	.51 (3.12)	-.10 (.66)

TABLE 3.7
(Continued)

	Any	Four-Year College	Two-Year College
N	541	541	541
R^2	.23	.30	.08
Adj. R^2	.18	.26	.93
F	4.92	7.01	1.50

NOTES: Numbers in parentheses are t-statistics. Dependent variable takes on values of either 0 or 1 for each observation.

* Significant at .10 level
** Significant at .05 level
@ Stepwise procedure excluded tkis variable because its F-value < .005

experiences. These estimates may be summarized by noting, first, that minority respondents with at least some vocational credits tended to be associated with less frequent participation in postsecondary programs. But there was no pattern of significance to these associations that suggested that more intensive participation in vocational education beyond a single course was systematically associated with less frequent participation by minority respondents in all postsecondary programs. Participation by whites in secondary vocational education did not seem to reduce overall participation in postsecondary programs. But it does seem to direct white students toward two-year college programs and away from four-year college programs.

Comparison with Other Research

Successful completion of, or enrollment in, each of several distinct postsecondary programs is not the only way to represent postsecondary experience. As discussed in chapter 1, Gelb defined a four point integer scale that reflected participation in postsecondary education. He also used a different measure of participation in vocational education to explain postsecondary experiences. His conclusions about the relative effects of different vocational specialty areas on postsecondary participation invite comparisons with the results that have been presented in this section, because he found a stronger tendency than was reported above for vocational education to be associated with either less frequent participation or a lower prestige form of participation in postsecondary education.

The results obtained by Gelb (1979) by analysis of the National Longitudinal Study of the High School Senior Class of 1972 (Class of '72) are considered next. These results were compared with a similar analysis of data from the NLS Youth. The replication was not strictly direct but parallels Gelb's work closely. The dependent variable was a four point scale. No postsecondary education was assigned a 0, vocational/technical school or training a 1, two-year college a 2, and four-year college a 3. In the NLS Youth study, other training programs not reported as college were also assigned to the vocational/technical category. Because of the difficulty that is inherent in interpreting such a scale, no interpretation was attempted. Rather, the scale serves as a common anchor point for comparisons of the relative contribution of sets of similar explanatory variables within the two populations. Another possible source of differences was the age span of the two groups. The Class of '72 had all been out of school approximately three years, while NLS Youth had one to five post high-school years. Because the scale was based on enrollment at some time, and did not consider length of time in the program or completion, this variation was not expected to cause major differences.

There were no differences of consequence between the two analyses in the explanatory variables relating to family background and sex. The minority variable, however, included Hispanics in the NLS Youth and blacks only in the Class of '72. Class rank ranged from 1 to 10 in the Class of '72 but had 100 intervals rather than 10 in the NLS Youth. The effect of this scale difference was not expected to be great because there is monotonic correspondence between the two scales. There was no suitable aptitude measure available for NLS Youth, which left class rank as the only proxy for that variable. In Gelb's analysis, the curriculum variables, recorded from an administrator's scrutiny of the high school transcript, supplemented in a relatively few cases with self-report, were used to assign each case to a curriculum or specialty. In the present study, students were classified as vocational, and a vocational specialty was assigned on the basis of sufficient participation at or above the level of Concentrator/Explorer, as described in chapter 2. Students were classified as having taken a general curriculum if they fit either of two descriptions: (1) the student reported a general curriculum and took fewer than two credits in any one vocational area; or (2) the student reported a vocational curriculum but took fewer than two vocational credits in any one area. Many of the students who fit these descriptions took no vocational credits at all. Although the coefficients produced by the ordinary least squares regressions show substantial enough differences between the two groups making up the general curriculum to warrant attention, there was no comparable division in Gelb's work, thus requiring a combination of the groups if comparisons were to be made. The results of the equations are presented in table 3.9, with further definition of the variables presented in table 3.8. All of Gelb's coefficients are reported to be significant at the .05 level except health education (HE). The t-values are reported for the NLS Youth results.

The reference group for the equation that produced these results was made up of those high school seniors who were graduated and who were reported in the respective data bases as not being in a vocational or general curriculum. In the NLS Youth, actual courses taken superseded the curriculum indicated if the student had developed a specialty and could be classified as a Concentrator/ Explorer or higher.

The family, minority, sex, and class rank coefficients had similar signs in both studies, and with the exception of the sex variable, had similar order and significance. Sex was not significant in the NLS Youth data. Otherwise, there were no surprises in the relationships of the explanatory variables in the two populations. The magnitudes of the coefficients actually were quite similar as well, with differences ranging from a maximum of less than 0.2 units to a minimum of .006 units. The effect of family, race, and class rank appears, therefore, to be generally robust across the populations.

TABLE 3.8

COMPARISON OF POSTSECONDARY EFFECTS IN THE CLASS OF 1972 AND THE NLS YOUTH DATA: DEFINITION OF EXPLANATORY VARIABLES

HOME LEARN	Educational environment in the home
MO ED	Mother's level of education
FA ED	Father's level of education
FA SEI	Father's occupational prestige
MIN	Minority status; black or Hispanic 1, white 0
SEX	Female 1, male 0
APTD	Aptitude in school
RANK	Class rank
GEN1	General curriculum
GEN2	General curriculum less Voc
VOC	Vocational self-report but fewer than two credits completed in a specialty
AG	Agriculture
BUS	Business and office courses
DE	Distributive education
HE	Health education
HO EC	Home economics
T I	Trade and industry

TABLE 3.9

COMPARISON OF POSTSECONDARY EFFECTS OF HIGH SCHOOL CURRICULUM IN THE CLASS OF 1972 AND THE NLS YOUTH DATA

	Class of '72 Coefficients+	Curriculum Rank Order	NLS Youth Coefficients	Curriculum Rank Order	t-Value (NLS-Youth)
HOME LEARN	.056		.175		3.106
MO ED	.028		.042		4.802
FA ED	.025		.031		4.234
FA SEI	.004		.010		5.323
MIN	.542		.374		8.279
SEX	-.132		-.081		-1.843
APTD	.007				
RANK	.070		.013		16.094*
GEN1	-.769	6	-.698	est. 5	
GEN2			-.653		-11.636
VOC			-.903		-9.487
AG	-.977	4	-.798	2	-6.668
BUS	-1.080	2	-.645	6	-11.489
DE	-1.100	1	-.734	4	-5.003
HE	-.657	7	-.332	7	-1.600
HO EC	-.960	5	-.785	3	-5.008
T I	-1.070	3	-1.027	1	-13.014
CONSTANT	-1.050		2.349		
Adj. R^2	.39		.2996		
	N=not reported		N=3007		

+ from Gelb, Table 4 (1979)

* Because the scale is inverse compared to the other variables, the negative sign has been dropped.

The signs and significance of the coefficients of the curricular areas are also similar. Health education did not have a significant effect in either population, and the general curriculum category tended to have less of a depressing effect on position on the scale than most of the vocational specialties. The relative ordering of the coefficients, however, had no otherwise observable pattern. For instance, distributive education in Gelb's analysis is estimated to have the largest depressing effect, but in the NLS Youth it ranks fourth largest out of seven negative values for curriculum areas. Business has the second largest depressing effect in the Gelb data, but it is sixth in the NLS Youth. Certainly the lack of any other consistency of pattern argues against basing any policy decision upon the relative order of these explanatory variables. It is unknown whether the lack of agreement is due to the more rigorous definition of specialty used with NLS Youth, a problem of modeling, or a difference in the populations. Nor can it be determined by this analysis. The equations discussed in the previous section, therefore, seem more appropriate for policy recommendations, particularly in view of Gelb's omission of any measure of aspirations. The results from the NLS Youth data suggest strongly that any tendency for vocational education to reduce postsecondary participation is significantly overstated when the effects of aspirations are ignored.

The second of these comparisons is with the work of Meyer (1981). As explained in chapter 1, Meyer analyzed four dichotomous dependent variables that represent the likelihood of participation in various postsecondary programs (none, college, junior college, and vocational/technical programs). He measured participation in vocational education by the percentage of a student's courses that were in vocational education programs other than home economics.

For women, a separate measure of home economics courses was included. The vocational participation patterns used in the preceding analyses are similar to Meyer's vocational variable in that they include only professional home economics courses. The measure of vocational participation that was used here for comparison differed very slightly from Meyer's work. It was the percentage of a student's Carnegie credits that were in vocational education* (including professional home economics). Meyer's specification of postsecondary experience differs from that used here because his variable reflects only that the

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* The percentage of courses that were vocational averaged around 10 percent for the sample as a whole and ranged for individual respondents from zero to as high as 50 percent.

student has at some time been enrolled full-time in the applicable postsecondary program.

When the pattern variables were replaced in the linear probability models by the measure of the percentage of a student's courses that were vocational, the estimates for factors other than vocational education changed only very slightly. An illustrative set of estimates for factors that affect the likelihood of successful current enrollment or completion of a four-year college program is shown in Table 3.10. That program was selected for presentation here because it was the only one of the three postsecondary programs for which the percentage of vocational courses has a statistically significant impact for more than one of the four race/sex groups. A comparison of those estimates with the corresponding equations in Tables 3.4 through 3.7 verifies that estimated coefficients for factors other than vocational education change only slightly. There was also virtually no difference in the overall percentage of variation in the dependent variable that is explained by the linear probability model. Indeed, the comparison between the estimates that used the pattern of participation and those that used the percentage of courses that were vocational can be summarized in a simple rule: for all subgroups of respondents and all postsecondary programs, whenever the percentage of vocational courses makes a statistically significant contribution to explaining postsecondary participation, the Concentrator pattern does likewise in exactly the same situation and the rest of the equation is virtually unchanged. This is not surprising because the simple correlations between the number of vocational credits and membership in the pattern groups of Concentrator or Limited Concentrator is never less than .50 and averages around .60. The direction of the effects was the same for the Concentrator pattern and for the percentage measure. Moreover, the magnitude of the estimated effects for men for the percentage measure was quite similar to Meyer's estimates for his model with full controls. Meyer's estimates for the coefficients of the course percentage variable were -.29, -.25, and -.31 for black, Hispanic, and white men, respectively; the estimates here were -.39 and -.28 for minority and white men, respectively. For women the estimates given here are not as similar to Meyer's as they were for men. For black, Hispanic, and white women Meyer's estimates were, respectively, -.27, -.35, and -.31; the estimates using the NLS New Youth were for minority and white women, respectively,-.01 and -.15.

It would appear that, with respect to predicting postsecondary educational participation, the pattern variables and the measure of the percentage of a student's courses that are vocational contain much the same information. The pattern variables, however, pick up some subtler relationships between postsecondary participation and less intense involvement in vocational education that the percentage of courses measure misses.

Table 3.10

FACTORS AFFECTING THE PROBABILITY OF
SUCCESSFUL PARTICIPATION IN A FOUR-YEAR COLLEGE PROGRAM:
COMPARISON WITH MEYER'S WORK

	White Males	Minority Males	White Females	Minority Females
PCTVOC/100	-.28**(2.37	-.39**(2.17)	-.01 (1.45)	-.00 (.05)
RANK/100	.28**(.76)	.36**(4.56)	.31**(7.05)	.35**(4.52)
AGE	@	@	@	@
AGE2/100	-.02 (1.20)	-.01 (.45)	-.01 (.69)	-.06**(2.12)
UNEMP	-.01 (1.49)	.02**(2.38)	-.01**(2.13)	-.01 (1.16)
ASPIRE 14	.02 (.48)	-.01 (.09)	.02 (.74)	.04 (.83)
ASPIRE 16	.46**(14.34)	.23**(4.91)	.43**(14.89)	.28**(5.83)
ASPIRE 17	.60**(15.08)	.54**(9.01)	.64**(18.42)	.51**(8.44)
RURAL	.01 (.33)	-.03 (.48)	.07**(2.85)	-.02 (.32)
NEAST	.03 (.94)	.01 (.09)	.06**(2.34)	.02 (.36)
SOUTH	-.04 (1.41)	-.02 (.40)	-.03 (.96)	.00 (.11)
WEST	-.11 (3.09)	-.16**(2.82)	-.10**(3.17)	-.06 (1.05)
FA ED 12	.04 (1.33)	-.05 (.96)	.01 (.38)	-.05 (1.09)
FA ED 14	.00 (.10)	.03 (.37)	.04 (1.00)	-.01 (.18)
FA ED 16	.10**(2.31)	.02 (.27)	.10**(2.73)	.04 (.53)
FA ED 17	.09**(1.84)	-.20 (1.47)	.16**(3.70)	.18 (.16)
MO ED 12	-.00 (.02)	-.01 (.20)	.01 (.38)	.04 (1.02)
MO ED 14	.04 (.89)	-.08 (1.20)	.02 (.51)	.07 (.89)
MO ED 16	.05 (1.08)	.02 (.22)	.07 (1.59)	.08 (.92)
MO ED 17	-.02 (.31)	.37 (.21)	-.12* (1.82)	-.01 (.07)
MO WORK	-.01 (.34)	-.12**(3.12)	-.01 (.58)	-.04 (1.20)
NSIB	-.01 (1.33)	-.01 (1.02)	-.01**(2.26)	.01 (1.14)
Missing Data For:				
RANK	-.11**(2.79)	-.26**(4.07)	-.15**(4.58)	-.11**(2.00)
FA ED	-.07 (1.03)	-.07 (1.24)	-.01 (.19)	-.07 (1.39)
MO ED	.02 (.26)	.05 (.57)	-.11 (1.64)	.03 (.32)
MO WORK	.03 (.29)	-.25 (1.48)	.12 (1.21)	-.16 (1.57)
NSIB	.13 (.38)	.10 (.28)	-.08 (.34)	-.37 (.92)
ASPIRE	.16 (1.11)	-.05 (.18)	.16 (1.04)	
CONSTANT	.18* (1.79)	.46**(2.70)	.31**(3.55)	.09 (.41)
N	930	417	1161	541
R^2	.50	.39	.52	.29
Adj. R^2	.48	.35	.51	.26
F	33.15	9.13	45.08	7.87

NOTES: See Table 3.3

Summary of Findings

Returning to the three questions posed at the beginning of this paper, some at least partial answers are now apparent. The first question asked what proportion of secondary vocational students participate in postsecondary education. The majority of high school graduates do participate in some form of postsecondary education--about 71 percent. For those who are graduates of a secondary vocational curriculum with meaningful continuity, specialization, and concentration, the percentages range from 56 to 73. But when the variables of class rank and aspirations are taken into account, the direct effect of curriculum on postsecondary participation is sharply reduced. Even a conservative interpretation, allowing for possible bias in the measures of curriculum, class rank, and aspirations, leads one to the conclusion that successful secondary experience and aspirations for postsecondary education can more than offset whatever negative effect curriculum may have.

The second question asked what kinds of postsecondary education secondary vocational graduates undertake. The data show some interesting differences in this regard. Those students who take no vocational courses tend in the majority to enroll in four-year colleges; Concentrators, the students most intensely involved in secondary vocational education, are more evenly distributed across the three kinds of postsecondary training when they choose to participate. There was a slight plurality of enrollment in technical training programs over two or four year college, but still a relatively even spread. The proportion of postsecondary enrollment of the other levels of participation in secondary vocational education generally fell between the proportions of Concentrators enrolled and those with no vocational training. Here again the introduction of class rank and aspirations sharply reduced the effects of secondary curriculum choice or assignment.

The third question asked about the nature of the conditions that influence or control the amount and kind of postsecondary education in which secondary vocational graduates participate. The strong effects of aspirations and class rank have already been noted. Additionally, there were significant effects for four other classes of variables. Higher unemployment rates were positively associated with postsecondary attendance for minority males. Parents' educational level was found to have an important effect for whites. Interestingly, for white females, rural residence was also associated with higher rates of participation in four-year colleges. Also, one region of the country was differentially associated with postsecondary attendance. In general, living in the West was positively associated with community college attendance and negatively associated with four-year college attendance. The remaining significant coefficients did not appear to form a pattern.

Implications for Policy

Policy issues under current discussion include several which should be influenced by these findings. The fundamental issue deals with the basic role or roles of secondary vocational education. Is it to prepare students for immediate employment upon graduation from high school; to prepare them initially with further training expected; or to provide an element in a broad background of educational experience? Or is it to provide a technical and performance oriented, rather than an academic, educational experience in which to develop basic educational skills and assist individuals with the transition from adolescence to adulthood?

As presently practiced, secondary vocational education probably fills each of these roles for some students, and therefore should not be viewed in a single minded manner, but rather as a multigoaled enterprise. Controversy, however, has surrounded these functions. Given the diversity of the roles of secondary vocational education, the policy implications of the findings from this study may be different depending upon the point of view of the policymaker regarding the appropriate role. If immediate employment is seen as the proper objective, and the impact of labor market conditions beyond the control of secondary vocational education is ignored, then policy should be directed toward increasing the proportion of vocational high school graduates who have the skills to go directly to work and do not need further training. If the sophistication of job requirements is beyond the scope of the secondary school setting, then additional training of the technical sort should be encouraged. The data suggest that the results of most intensive participation in secondary vocational education are working that way. That is, when Concentrators engage in postsecondary education, they most frequently do so in more technical rather than academic programs.

However, the widely voiced belief in the right of individuals to make choices and change plans is ignored by this approach. Further, the individual economic and social value of advanced education and the societal value of a highly educated population is not served by such an approach. If advanced education is assumed to be a desired end, as well as the preservation of individual choice, then policymakers will need to attend to certain other influences which seem to bear strongly upon the student's decision to take part in postsecondary education programs. The single most powerful variable in these analyses was a measure of educational aspirations. It appears that the secondary graduate who expects to pursue postsecondary training is likely to do so regardless of high school curriculum. Even the pervasive effect of class rank is sharply reduced when aspirations are entered into the equation. Some studies (see, for example, Rosenbaum 1980) report that aspirations, though

strong, are sometimes unrealistic. Therefore policy should be directed toward providing the necessary prerequisites in secondary vocational education to make aspirations realizable if the student chooses additional education beyond high school and pursuing that choice is the policy object. Alternatively, continuous learning options of a nontraditional nature could be encouraged by policy, and might be much better suited to the vocational student than traditional academic studies. The data are consistent with a movement toward less academic settings by many secondary vocational graduates when they pursue postsecondary studies.

It seems clear, however, that vocational education is not an educational "dead end." These data do not support the contention that "tracking" whether selected by the student or imposed by the school, eliminates or severely restrains individual choice. The fact that curriculum effects are stronger for minorities, particularly males, suggests that policymakers should consider the nature of the vocational instructional program as it applies to these students. Other research (Campbell, et al., 1981) documents that immediate employment is also less available for them. Although the labor market may be the overriding influence bringing about the employment problem, the role of vocational education should be carefully reviewed.

Finally, if policymakers wish to take cognizance of the implications inherent in the diversity which characterizes the roles of vocational education, policy regarding the evaluation of vocational education should be reconsidered. The data examined in this study suggest that the vocational education student is served in other ways than those directly resulting in training related employment with high employer satisfaction. The data also suggest that vocational education serves many students whose ultimate employment requires continuing education beyond high school. Therefore policy for evaluation should reflect broadened criteria unless it wishes to ignore the actual selection and assignment of secondary school students.

The selection of policy options is not a research question, but rather a political one Determination of the methods through which policy may be implemented is however, a research question. What determines the development of aspirations and can this development be influenced by the school? Does the choice of high school curriculum determine aspirations or do aspirations determine curriculum choice? These questions need answers if policy is to be based on adequate information, because even if the role of vocational education is limited to preparation for immediate employment, the individual and societal values of informed and appropriate selection cannot be attained without the answers.

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APPENDIX

Technical Note on Educational Aspirations

The educational aspirations measure that was used here was the level of education that the respondent "expects" to attain (as opposed to the level that the respondent "would like" to attain) as of the 1979 interview. The question was answered at different stages in the educational de elopment of various respondents. An ideal measure would apply to the same stage of educational development for all respondents and would precede any chance for participation in postsecondary programs. For some respondents, because the question was asked of them after the· had had opportunities to participate in postsecondary programs, the measure of aspirations reflects both goals and experience. It is not, therefore, a "pure" measure of educational goals and is probably more strongly correlated with actual postsecondary participation than a pure measure of goals would be. That is, there are likely to be errors of measurement in the aspirations variable that are positively correlated with participation in postsecondary educational programs. These measurement errors imply that the estimated effects of aspirations on postsecondary participation were exaggerated by the equations that were reported here. As the positive correlation between participation in postsecondary programs and the error in the measurement of aspirations becomes higher, the exaggeration is greater.

The bias in the estimated effects cannot be determined. The range within which the bias is likely to fall can be approximated by considering how the estimated coefficients vary as the specification of aspirations is changed. The illustrative estimates in table A-1 for models explaining Y_0 show that the highest estimated effect is given by the "expectations" form of the variable, a lower estimate by the "desired" form, and the lowest estimate by the "friends-goal" form of the question. These results suggest that there may be a positive bias when the "expectation" form of the aspirations variable is used. The form of variable that uses aspirations of the best friend of the respondent is likely to be biased toward zero from the true aspirations coefficient and provides an estimate of a lower bound for the true aspirations coefficient. That reasoning suggests that the true coefficient for aspirations probably lies below the estimated value for the expectations form of the variable but above one half of the estimate.

The principal concern for this report is whether the bias in the aspirations variable contaminates the estimates of the effects of vocational education on postsecondary participation. A theoretical analysis shows that the bias in those estimates of the effects of vocational participation depends on three correlations:

1) Between the error in the aspirations variable actually used and the likelihood of postsecondary participation;

2) Between the intensity of participation in vocational education and the true measure of aspirations; and

3) Between the intensity of vocational participation and the error in the aspirations variable actually used.

The first correlation is expected to be positive, the others are expected to be negative. If those expectations are met, the bias depends positively on the absolute values of those correlations. The estimates overestimate encouraging effects and underestimate discouraging effects of vocational education on postsecondary participation.

An illustrative estimate of the bias in the estimated impact of the patterns on Y_0 can be obtained by observing how the variation in the estimated coefficients for the patterns varies as the specifications of the aspirations variables are altered. The variations in estimates are shown in table A-2. The fact that the estimated coefficients are usually more positive when the weaker forms of the aspirations variables are used suggest that positive bias probably exists but that it is not very large. The bias is most prominent for white females and for white male Explorers.

Another study which defined aspirations in a similar way, but used data collected prior to the beginning of the aspired enrollment in postsecondary education (Rosenbaum 1980), and thus avoided one potential source of positive bias, also reported a very large coefficient for aspirations after holding constant a set of theoretically relevant variables. In fact, the reported coefficient is over four times as large as that of the next highest explanatory variable. Thus, although the cautions regarding positive bias are noted, the interpretations in the present study appear reasonable and appropriate.

TABLE A-1

EFFECTS OF VOCATIONAL ASPIRATIONS ON
THE LIKELIHOOD OF SUCCESSFUL PARTICIPATION IN ANY
POSTSECONDARY PROGRAM

Aspirations Level (In Years of Schooling)	Aspirations Form		
	Expect	Would Like	Expect of Friends
Minority Males			
12-14	.17**	.12	-.02
14-16	.37**	.21**	.15**
17 or more	.52**	.47**	.20**
White Males			
12-14	.07*	.02	.05
14-16	.40**	.24**	.17**
17 or more	.48**	.38**	.26**
Minority Females			
12-14	.24**	.17**	.23**
14-16	.34**	.31**	.17**
17 or more	.45**	.32**	.30**
White Females			
12-14	.19**	.14**	.19**
14-16	.49**	.31**	.22**
17 or more	.55**	.44**	.24**

NOTES: See Table 3.3

Table A-2

EFFECTS OF VOCATIONAL PATTERNS
ON SUCCESSFUL PARTICIPATION IN ANY POSTSECONDARY PROGRAMS
FOR VARIOUS SPECIFICATIONS OF ASPIRATIONS

Patterns	Aspirations Forms		
	Expect	Like	Expect of Friends
Minority Males:			
Concentrator	.04	-.02	-.03
Limited Concentrator	.06	.06	.06
Concentrator/Explorer	-.14	-.12	-.15
Explorer	-.29	-.34	-.39
Incidental/Personal	-.02	-.02	.01
White Males:			
Concentrator	-.01	@	-.02
Limited Concentrator	.11	.10	.07
Concentrator/Explorer	-.02	-.03	-.02
Explorer	.09	.05	.01
Incidental/Personal	.01	.02	.02
Minority Females:			
Concentrator	.05	.02	.02
Limited Concentrator	-.04	-.06	-.07
Concentrator/Explorer	-.10	-.11	-.11
Explorer	-.35	-.36	-.40
Incidental/Personal	.02	.01	.00
White Females:			
Concentrator	.01	-.02	-.01
Limited Concentrator	.01	-.01	-.06
Concentrator/Explorer	-.03	-.03	-.09
Explorer	.09	.11	.09
Incidental/Personal	.01	.01	.12

NOTES: See Table 3.3
Control variables in these equations differed slightly from those reported in Table 3.3. They include all variables shown there plus six dichotomous variables reflecting father's occupation. Dependent variable is any postsecondary programs.